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Running head: E-COMMERCE STUDY

Search Optimization Techniques in the Creation of an Online Store Website

A Thesis Presented to the Faculty of the Department of Communication

Rochester Institute of Technology

in Partial Fulfillment of the Master of Science Degree in

Communication & Media Technologies

Anna Y. Boriskina

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Abstract

Business organizations involved in e-commerce recognize the importance of how commerce searches are conducted by individual customers. In 2005, 80% of all Website visits began with Internet searching. Altering a Website so that it ranks higher for particular terms used in Web searches is called “search engine optimization.” The present study investigates how search engine marketing activities may result in higher rankings by such search engines as Google, Yahoo, MSN and Ask. One method of search engine marketing is illustrated by optimizing a new Website, www.thelightingdivision.com

The results may interest online marketers and search engine optimizers wishing to increase the visibility of their business enterprise and considering search engine studies as a part of their advertising campaigns.

Key words:

E-commerce, Internet Searching, Search Engine Optimization, Search Engine Marketing, Search engines, Online Marketers, Search Engine Studies, Advertising campaigns

Introduction

One of the definitions of search engine optimization (SEO) is provided by Klein, (2006), and reads as follows:

Search engine optimization is the process of tweaking your company's Website so that it will show up prominently when potential customers search online for your products or services. Surveys show that search engine results increasingly drive customers to Websites and that consumers prefer results that show up naturally when they search on sites such as Google and that are not advertisements (p. C5).

Search engine optimization has to be kept in mind from the very start of Website development. The methodology of search engine optimization must be incorporated in every Website feature.

In the present study, the researcher aims at developing an online store www.thelightingdivision.com for a company called The Lighting Division, a unit of Quality Contract Assemblies, Inc. The company is a typical local Rochester, New York business enterprise that at the moment cannot afford expensive advertising. At the same time the company is striving to become known and recognized by search engines, local and global businesses, and individuals. The owner of the company, Richard Frank, concurs with Victor Harrison, chief executive of Thinkhandsfree, a company that markets hands-free carphone products to company fleets, who asks rhetorically, "More people see a site as a validation of a company's authenticity- if you do not have a site, are you a real company?" (Revolution, 2005, p. 48).

The Lighting Division sees its search engine marketing (SEM) strategy mainly oriented at getting high organic or natural results versus paid results. The success of search engine

marketing of small businesses on the Web in general depends on understanding the audience, the message and capabilities that the company possesses to deliver the product or service it markets. Industry practitioners agree that larger companies ready to invest in advertising tend to be more recognized by the search engines. Keith Marsden from 192.com explains that the main search engines do not work in favor of small businesses. In a search, they list the companies that receive the most visitors and have large sites containing a great deal of information at the top. Marsden suggests that small business concentrate on search engine optimization for local and state markets. Local online directories allow small businesses to make the most of their “local-ness,” enabling them to stand out by virtue of their proximity and convenience.

Terri Mollis of Web design agency Pilot Interactive, whose clients include the BBC, Disneyland Paris, and Nestlé, does not completely agree with the previous point of view, and believes the Web is the perfect platform for growth.

The net opens up the global marketplace to small companies and gets them out there, alongside the big names. Often, it is their smaller size that makes them more attractive to customers. The product or service on offer, and how it is promoted, is far more important than the size of the company.

Andy Vining, co-founder of offers site BluRoute, points out:

While all businesses can use the internet to dress themselves up and look more substantial than they are, this does not constitute a level playing field in terms of marketing. Having a Web presence is the easy part getting consumers to visit your site is the big issue. This not only includes the use of cost-effective viral-marketing techniques, which are available

to all companies, big or small, but also requires costly traditional marketing. Small businesses just cannot afford that overhead (Revolution, 2005, p. 49).

Nevertheless, The Lighting Division is ready to try both a localized and global approach for Search Engine Marketing working both online and offline. The whole project is divided into three well connected work stages: Website development; Website submission and an ongoing process of submission to many directories; working through blogs; and analysis and tracking of traffic (visits or hits by potential customers), sales and ranking of the Website by the major search engines such as Google, Yahoo!, MSN and Ask.

The main goal of the current thesis project is to build a Website with appealing capabilities (such as image galleries) with simple and logical navigation and good content. All of the above-mentioned techniques are aimed at enabling both businesses and individual customers to make their product choices easily, understand LED technology, see the real value of LED lighting and finally, buy many lighting products from The Lighting Division. Working through design, crafting messages, and understanding links are important factors of SEO that will lead to the future success of the online store.

This project will introduce further stages of SEM and explain the principles behind a number of theories. Although it will not include analysis of customers' responses to the Website or the site's ranking by the search engines, it will depict detailed plans for each stage of implementation.

Literature review

According to Jansen & Molina (2005), e-commerce is developing into a fast-growing channel for new businesses. They emphasize the importance of a strong Web presence for

commercial success of every trading organization. Sweeney (2001) believes that there are three essential components that make up e-business success: the right e-business model, the right Website, and the right volume of targeted traffic to a site. As the size of e-commerce operations expands, more attention is paid to examining how everyday commerce searches are conducted at the individual customer level. Greenberg (2000) reports that in 2000, an additional one million pages were added to the Web each day. Eighty five percent of all Internet users went directly to search engines to find what they were looking for online, according to Georgia Institute of Technology. Scoviak (2005) refers to Forrester Research data demonstrating the significance of the search engine or directory services. As e-commerce progressed in its development, in 2005, 80% of overall Website visits started with Internet searching. That is what makes search engine optimization (SEO) the hottest topic in the Internet field. Lohr (2006) claims that SEO is a booming business estimated at \$1.25 billion in worldwide revenue in 2005, and projected to more than double in 2006. Research conducted by the MoreVisibility agency in 2006 and reported by *PRWeek* (2006), estimated how popular Search Engine Optimization and Search Engine Marketing are and how firms are measuring success. Key findings demonstrated that out of 459 respondents from a variety of US companies surveyed via e-mail, 64% of respondents reported having an SEM program at their company, 59% of respondents have an SEO program at their company, 63% reported not to have updated the company's Website in one year, and 24% reported actively pursuing SEO for four or more years.

Danny Sullivan, SearchEngineWatch.com editor, defines search-engine optimization as “the act of altering your site so that it may rank well for particular terms used in Web searches. The ideal is to get a Website to the top of the results of a Web search, or at least on the first page

of results” (Mangalindan, 2003, p. R1). Lohr (2006) emphasizes the importance of SEO to e-commerce business. “For these sites, search engine optimization has become a constant battle of one-upmanship, pitting the search engine technologists against the marketing experts and computer scientists working for the Websites” (Lohr, 2006, p. 1). Cytrynbaum (2006) of Google avers that the success of search engine optimization starts from definition of goals in terms of traffic, sales, lead generation, cost per acquisition and branding.

Moran & Hunt (2005) refer to two distinct ways that search results land on the screen: organic or natural results and paid results. Organic results are the “best” pages found for the words the searcher enters. When people refer to (SEO), they are talking about how the company gets its site’s pages to be shown in organic search results. Searchers trust organic results, and therefore, an organic search must be a part of every search marketing program. Wagg (2006) identified the benefits of an organic strategy as providing multiple search results across the same keyword combination and having more descriptive capability (i.e. the title can be more than twice that of a paid placement ad with 64 characters versus 25 and double listing capability).

Paid results refer to a variety of revenue-generating activities by search sites, encompassing both paid inclusion and paid placement. Paid inclusion guarantees that a site’s pages have been catalogued by the search site, so that they can be returned when they closely match an organic search. Paid placement allows a Website to pay to have its page shown in response to a particular search word entered, regardless of how closely the page matches what the searcher entered. Moran and Hunt (2005) report that, “The page search market hit \$2.9 billion in 2004 and is expected to nearly double to \$5.5 billion by 2009” (p. 5). Wagg (2006) ascribes numerous benefits to paid results: Paid placement strategy is “immediate” with set up

and activation within 30 minutes. The marketer knows exactly the budget to spend on SEM and ROI. The author refers to the market segmentation of a paid placement strategy as: “Who you want, where you want”

(http://www.jupiterevents.com/sew/toronto06/_powerpoint/Wagg_BPOL.ppt#262,7,Slide 7).

With this strategy, any commercial organization targets any segment within the time frames chosen by the marketer. There is little doubt that paid strategy provides more control for any online store.

It was unclear whether natural or paid search activity dominated this market in 2005. However, during 2006 SEM Conference in Toronto, Kennedy claimed that 70% of users click on organic listings while 30% click on ads. Pew Internet (2005) claims that 62% of users cannot tell the difference between organic and paid listings. For many companies, the best solution could be a combination of the two. Spike Robinson, managing director of the online ad company Allegran Advertising, sees another way forward, "The days of paying a premium to a search engine are being replaced by a much fairer model: having good content and focusing on the site's audience, combined with paying a bit of money to a search engine" (Precision Marketing, 2005, p. 18). According to Kennedy (2006) marketers spent \$5.5 billion on paid listings in 2005 compared with just \$660 million on optimization for organic listings (12%). Marketing Sherpa's Research team expected to see optimization crack \$1 billion in 2006. Proctor & Gamble allots 10% of marketing budget to search. Rugman.com (2006) asserts that a paid advertisement strategy will bring the store 25% more orders and 100% more revenue while organic strategy secures 500% less cost in terms of return on investment (ROI).

Search engine marketing (SEM), which is a broader term than SEO, encompasses any kind of search results. SEM is everything that should be done in order to raise Website visibility and attract more visitors. Brent (2005) suggests that companies look to SEM as an instrument that can raise their online brand image recognition. "SEM not only garners brand image for a company, it can also help you acquire new leads and raise the brand's or organization's public image, online and off" (Brent, 2005, p. 26). Sweeney (2001) claims that one can have a great Website using the right e-business model, but with no traffic no online success will be achieved.

Search engine optimization is an improvement of Websites organic search results. According to www.SearchEngineNews.com (2006) SEO often seems mysterious if one is just starting out, but 90% of it is really just focused on finding ways to achieve three main goals: 1) Build a site that is easy for search engines to find and process; 2) Collect the search words that customers will be using to find the site, and incorporate those words into Web pages; and 3) Get important Websites similar in topic to your own to link to you, so that search engines know your site is an important destination. Radin (2006) explains what it takes to modify pages and work with other Websites so that your Website shows up sooner in the results listings when a prospect searches for something related to what you do. Radin (2006) claims SEO also means tracking how people find your Website, where they go on your Website and analyzing purchasing patterns, e-mail marketing, affinity programs, blogs, audio/video, Podcasts, and Really Simple Syndication (RSS). RSS is a technique used to deliver Web articles, blogs and podcasts to users by subscription as soon as they are posted.

Moran and Hunt (2005) advise marketers intent on getting Website pages in the search index to choose the right keywords and optimize the content. Shultz & Fristedt (2005) declare

the following six proven methods to be crucial in SEO initiatives: 1) Setting a baseline for measuring and maintaining SEO success; 2) Identifying key words for important site sections; 3) Refreshing content and changing keywords; 4) Revising Website design and publishing technology to prevent barriers to page indexing; 5) Employing effective link development programs; and 6) Visiting competitor Websites with higher page rankings to review their keywords, copy, design, and technology. Robinson (2005) adds other important points such as not replacing textual content with images or multimedia content. It is always advisable to add a key-word-rich description of the image. In addition, engines have a tendency to re-think and re-rank the site before they move it up a few months later from the moment the site was registered with various search engines.

Marckini (2001) declares that as search engines and directories have increased in number, sophistication, and complexity, so too have the art and science of search engine positioning. Existing search engines and directories are constantly changing their search algorithms and striking new alliances, and new search engines are emerging. Search engine optimization is impossible without identifying where the searchers actually go to get important information for them. Search engine optimization is closely connected with search sites' rankings. According to Moran & Hunt (2005), among worldwide search engines, Google and Yahoo! were the top two competitors, but the landscape can change quickly. In 2005 Google occupied a 37.6% share of searchers, where 30.4% belonged to Yahoo! Such search engines as MSN (15.6%), AOL (9.2%), Ask Jeeves (6.1%) were less competitive, according to comScore MediaMetrix (July 2005). Other Websites occupied only 1.1% of searchers' preferences. In 2006 three major players and one promising runner-up dominate almost the entire search engine industry. "The major players

are, in order of market share – Google, Yahoo! and MSN. Ask possess strong search technology but limited market share” (<http://www.SearchEngineNews.com>, May, 2006).

According to Kent (2004) it is still worth marketers’ attention to consider specialized directories. For just about every subject one can imagine, someone is running a specialized search directory. Although specialized directories get very little traffic when compared to the Googles and Yahoo!s of the world, the traffic they do get is highly targeted, just the type of people online businesses want to attract. The reasons to care about directories are as follows: They provide another channel to the Website from search engines. Some of the pages at these directory sites have very good PageRanks and, as a general principle, links are good. Some of these directory sites get a lot of traffic.

Kent (2004) believes that working with Yellow pages is another beneficial element of search engine marketing. The author claims the largest and most profitable sites are as follows: Yahoo! Yellow Pages www.yp.yahoo.com, InfoSpace www.infospace.com, Worldpages.com www.worldpages.com, SBC SMARTPages www.smartpages.com, BellSouth RealPages.com www.realpages.com, Yell.com www.yell.com, YellowPages.com www.yellowpages.com, DexOnline.com www.dexonline.com, Yellowbook.com www.yellowbook.com, Yellow.com www.yellow.com, and Verizon SuperPages www.superpages.com

Kavanagh (2006) suggests that all Internet search engines fall into three basic types: crawled-based, human-powered, and hybrid of mixed results. Crawled-based search engines, such as Google, rely on automated programs to find Websites. Unlike a crawler-based search engine, a human-powered search engine does not go out to find links--the links come to it. Users submit sites to human-powered directories, such as the Open Directory (www.dmoz.org) or

About.com (www.about.com), and a human staff reviews each submitted site. The staff member considers the following when reviewing the Website: Checking whether the content has an overall value, whether it is current or out of date, and whether it is complete or under construction. Additionally, it is important for human-powered directories to evaluate if the site is located at the submitted URL or elsewhere via a redirect page and whether the site is original or it repeats the information elsewhere. Hybrid or mixed results search engines, such as Yahoo! (www.yahoo.com) and MSN (www.msn.com), use a combination of crawled-site links and human categorized links. These engines allow you to browse for links by category or topic, or by entering keywords for general searching. Most hybrid sites obtain their listings from a combination of other search engines, both crawler and human powered, such as Google and Open Directory. Hybrid sites usually rank their search results by relevance, just as crawler sites do.

The outstanding success of Google from the searcher's perspective is not just a case of entering what one is looking for in the search box and hoping for the best. "Google offers the searchers many ways-via specific syntax and search options- to refine search criteria and help Google better understand what they are looking for" (Calishain & Dornfest, 2005, p. 1). According to Cohen, director of business technology at Time.com, "If you are not in Google, Yahoo! and MSN, you really do not exist to a large part of your audience" (Folio, 2005, p. 52).

Moran & Hunt (2005) point out that Web searches changed forever in 1998 with the launch of Google. Since 1998 Google has continued to innovate by introducing the first tool bar for browsers, by steadfastly separating paid search results from organic on its results page, and by employing new paid search techniques. Google introduced the AdSense paid search program,

which combines both bidding and the popularity of an advertisement to decide which one is ranked number one. Google places tremendous value in link-structure-internal, external, inbound and outbound –and page content. The Algorithms that search engines use to find and index Web pages are closely guarded secrets. However, all search engines provide low ranks to the Websites that have broken links and incomplete or weak linking structures within the site.

Gosney & Boehm (2000) advise that search engine submissions need to be repeated every three to six months, as the number of new sites being submitted grows rapidly on the Web. With several thousand sites popping up every day, search engine databases are growing dramatically. A site that was once listed early in a search after initial submission might now be pushed back due to new sites replacing it.

All of the authors who analyze search engine optimization phenomena underscore the importance of content in the creation of effective and efficient online stores.

Jarboe (2006) implies that one traditional model of communication “Who says what in which channel with what effects [*sic*]” by Lasswell in 1939 is now replaced by a new model of communication that reads: “Who seeks what in which channel from whom with what effects?”

Keyes (2000) defines content as facts and expressions of a point of view or opinions. McAlpine (2001) suggests that “content is king” and content usually means words. A great Website needs four components: great strategy, great design (especially navigation), great technology and great content. Garrand (2001) prompts the companies that wish to start selling online to follow some basic instructions such as: checking the accuracy of facts, keeping sentences short and using simple sentence constructions, using the lead or first sentence to tell simply and clearly what the following text is about, using active voice, using descriptive nouns

and verbs and avoiding adjectives and adverbs. Garrand (2001) stresses the significance of word choice and avoiding jargon and technical terms unless they are meant for specialized audiences. Folio (2005) explains that content analysis involves a variety of a page's features including fonts, sections and the location and density of each word. Lattner (2005) sums up the key points about the growth of content management. The importance of the integration of Web portals and other applications-including records management, digital asset management and advanced internal utility or search engine appliances-is needed for unified access to information across all resources to increase productivity and consumer personalization.

Howard (2004) claims that keyword density is very important for search-engine algorithms. It is essentially the frequency with which a search term appears on a Web page. If a keyword appears too few times, it is deemed less relevant; if it appears too many times, it is deemed spam by the spider. Specialists in this industry declare a range of five to 10% for keyword density to be a good ballpark figure. In addition, it is important to write for both the search engine and your customer. The copy should flow naturally.

Garrand (2001) emphasizes that highlighted words, variation in typeface and color, meaningful subheadings, bulleted lists may serve to better organize the content in for computer screen reading. Using one idea per paragraph, employing the inverted pyramid style (starting with the conclusion), and posting fewer words than conventional writing will help customers find the information they need faster.

Robinson (2005) offers companies advice on selecting the right keywords for relevant content, arguing that a search engine with a huge list of key words will not help the business. Instead, search engines may consider such key word overuse to be spamming, which can lead to

a Website blacklisting. Telecomworldwire (2006) reports an example of such blacklisting when Google lowered the ranking of BMW's German site after the German Website car manufacturer reportedly tried to improve its popularity ranking artificially on Google. Google is understood to have issued a "Google Death Penalty" on BMW's German Website, which lowers its profile on the Internet substantially. BMW seemed to have used underhanded methods to ensure searches for BMW and "gebrauchtwagen" (used cars) would list its Website first, according to blogger Matt Cutts, who claimed to be a software engineer for Google. Cutts said "gebrauchtwagen" had been written 42 times on BMW's doorway page in the company's search engine optimization practice. Google responded by lowering BMW's German site PageRank to zero, which means the site will no longer appear as the top selection for those searching for BMW in Germany. It is not clear whether BMW realized it was acting incorrectly, but Google said the practice was a violation of its guidelines.

According to Robinson (2005) and SearchEngineNews.com, it is vital to understand the goals of the site as they relate to a search. Writers should prioritize what they would like people to find as well as what those individuals might be looking for. According to <http://www.SearchEngineNews.com> (May, 2006), every aspect of crafting a Website-for-profit revolves around carefully chosen and strategically placed words. Keywords are big business and there is much to be gained by getting them right. Sack (2006) claims that keywords have a "price," "rate of return," and "risk." At the same time marketers today can "plot" performance over "time" and correlate with "value." "Market" access is also available. Search engine marketing experts prompt commercial enterprises to identify what the keywords are, understand how to find them and what to do with them once they are found. Many plug-and-play statistics

software packages are available, providing information about what users are searching for.

Szetela (2006) names just a few of them: keywordanalyser.com, softnik.com and many more.

Goodman (2006) admits that core keywords can be expensive, secondary keywords identification process can be complex and lengthy. The author suggests using such tools as those provided by Google and Yahoo, commercial research tools available at the moment, search engines, and competitor's Websites. Goodman adds that logic and industry knowledge, news and other media ads can help create a viable keywords' list.

Www.hotelmag.com (March 2005) informs that keywords search exceeded 50% of all advertising dollars in 2005. Kendler (2006) declares that most marketers involved in SEO and SEM are concerned about the rising cost of keyword prices and the competition for these keywords. Sack (2006) emphasizes the idea that the pay per click (PPC) market is in constant flux where companies exist and enter the marketing regularly, where some keywords are more volatile than others and where bids change throughout the day, week, month and year. Being a practitioner, Sack provides additional information about how people bid for the keywords. The author states that many times people bid without the supporting data. Searching patterns vary during the day and week; different times of day may produce different customers. According to Sack (2006) keyword bidding developed two main theories – keywords like investments and bidding like playing “BlackJack.”

High key word cost raises the campaign budget simply to sustain the current keywords set. Dudley from WebsiteBiz (2006) predicts that keyword prices will continue to rise until the point that marketers determine that cost outweighs the return. Many industry experts concur that currently search engine marketers spend irrationally on search when they do not have conversion

tracking in place and do not understand bottom-line results. Kendler (2006) claims that marketers will become more sophisticated and that they will employ best practices. Competitive techniques will level the playing field. When it comes to e-commerce Gosney & Boehm (2000) suggest that the customer needs to immediately see any ingredients or sub-components of a product that is offered to them. A verbal description of the product can be valuable when relating details not presented by an image or video. It is important to include any internal part numbers a consumer might need when ordering an item either online or via another medium (i.e., phone).

Another important element of every Website for the purposes of search engine optimization is linking. Kent (2004) attributes Website success to links back when the Web began booming in 1994. Moran & Hunt (2005) believe that link building to one's Website is one of the most important tasks. "Link magnets or link landing pages (that can attract search engines) must provide a strong reason to be linked to" (Moran & Hunt, 2005, p. 354). Such reasons may include a complimentary product or service, valuable information, an authoritative source of information, a desirable tool, or a business relationship. Searchengineneeds.com (2006) encourages sales sites to such incentives for linking as a buyer's guide or consumer report, an educational tutorial, a product comparison chart, the top 10 most common mistakes, an entertaining game interface, interactive assessments, an annotated links page, a glossary of terms, a history of topic, online tools, or FAQs.

Hekl (2005) refers to the connection between landing pages and buyer behavior. The author claims that in an SEM environment, the marketer has a tremendous opportunity to influence buyer behavior through interactions on the landing page, even when the customer is completely unknown (except for the referring search phrase). Most specialized landing pages

come in one of two flavors - either they are targeted to an immediate purchase transaction, or they feature multiple offers. Marketers have no way of knowing where their potential customers are in their personal buying process when they click through a paid search ad. The only clue is the selected keyword. Many landing pages are biased toward the final stage in a customer's buying process - the transaction.

According to Calishan & Dornfest (2005), the importance of a Web page can be judged by the number of hyperlinks pointing to it from other Web pages. This concept is employed by Google. To the marketer it means that Web page ranking depends on the number of incoming links and the number of outgoing links on the page that point to the page. The PageRank of a Web page is therefore calculated as a sum of the PageRanks of all pages linking to it (its incoming links), divided by the number of links on each of those pages (its outgoing links). According to the opinion of SEM practitioners from <http://www.SearchEngineNews.com> (2006), reciprocal links have become less valuable than one-way links in terms of ranking highly in the search results. Because search engines know that Web masters will often conspire to boost their search engine rank by agreeing to swap links, they will tend to discount such links to a degree. Regardless, there are cases where reciprocal links can be helpful – especially when they are from important pages.

Kent (2004) points out that Web users like long link text, links that are more than just a single word but that actually describe where the link takes them if you click on it. Usability testing shows that long link text makes it much easier for visitors to find their way around a site. A long link provides more information to visitors about where a link will take them. Long links that explain what the referenced page is about are a great thing not only for visitors but also for

search engines. By using keywords in the links, the marketer is telling the search engines what the referenced pages are about. In 2006, search engine specialists from <http://www.SearchEngineNews.com> completely agree with Kent. Getting keywords into the anchor text of the incoming links is considered to be one of the most powerful page ranking factors available for SEO.

When it comes to the issue of search engine relevance to customers in the real world, Arnold (2005) suggests the following, "Rankings can be influenced by following some common-sense rules. None of the optimization tricks is much of a trick. Good content, accurate programming, and useful indexing are basic guidelines to follow" (p. 22). Moran & Hunt (2005) point out that search results are ranked by relevance, the degree to which the pages match the subject of the query. Fox (2005) announces Google plans to dramatically improve the results of Internet news searches by ranking them according to quality rather than simply by their date and relevance to search items. The database is to be built by continually monitoring the number of stories from all news sources, average story length, number with bylines, number of the bureaus cited, and how long they have been in business. Google's database will also keep track of the number of staff a news source employs, the volume of Internet traffic to its Website and the number of countries accessing the site. Google will take all these parameters, weight them according to formulae it is constructing, and distil them down to create a single value. This number will then be used to rank the results of any news search.

Marckini (2001) considers site visibility to the human customer and to the search engine to be two separate matters. For the purposes of SEO, the secret to increasing search engine visibility is to focus on interaction with the search engines. The author explains that the

"customer," for all practical purposes, is a spider or other robot that must find, navigate, and read the site. Marckini (2001) warns designers from using the following elements in their design methods: a platform with dynamic content, a design dependent on frames, the use of design elements such as Flash or multimedia, the use of image maps for navigation, password-protected areas, the required acceptance of cookies, the use of META refresh tags.

Karcher (2006) from the Karcher Group avers that optimization of the code and structure of the Website will help all users and search engine strategies (SES) follow the content and structure of the Website, improve site accessibility, allow search engines to focus on content and keywords rather than sorting through code. The author also prompts marketers to make site load faster and easier to maintain, to name files and folders according to content swaying away from the generic names.

The American Salesman (2004) published Website design standards that might just be true for all time. These are having a clear look and feel, updated content, simple navigation, more than just text, interactivity, search engine optimization, knowing the Website budget, targeting the right audience, and maintaining the site.

Moran & Hunt (2005) add other critical elements of design cautioning the marketers and designers on the misuse of JavaScript and style sheets. Although both JavaScript and style sheets improve a site's appearance and usability, they also create bloated pages that impede crawling and harm keyword prominence. According to <http://www.searchEngineNews.com>, search engines run a program called a spider that downloads Web pages, reads the text and links on those Web pages. Then it decides what to do with the page based on that information. This is known as "crawling." The authors also mention that having many images on the landing pages

may cause crowding of text. With the image-laden page that contains very little text (fewer than two dozen words); the search engine might not correctly identify the language of such a page, putting it at risk of being erroneously excluded from queries using language filters. That same lack of text can make it quite challenging to provide enough keyword occurrences to attain high rankings. Karcher (2006) encourages designers and marketers to use heading tags, which is another way to tell users what the page is about. The author declares headers to be a great opportunity to insert relevant keywords.

One of the important topics of today is Customer Relationship Management (CRM). This term is also applicable to search engine marketing. Precision Marketing (2005) declares that as consumers become more aware of the SEM, bidding wars and payment plans in place, there is the risk that they may feel they are being misled in some way. This could harm the relationship brands have with some customers. Sweatt (2005) claims that many companies virtually ignore what their sites actually say and do for visitors, spending inordinate resources on where they stand in search engines. Communication with customers should never be forgotten, and reaching customers through forums, blogs, chat rooms and newsgroups is an important instrument for raising the site visibility for both your customers and search engines. Gordon (2006) provides his advice for smaller companies that are not press release machines and have fairly static Websites. He claims that one way to make sure companies appear at the top of those searches is to maintain a fairly active blog.

Pew Internet & American Life Project (2005) report that 39 million American adults read blogs, 45 million use RSS, and 13 million American adults have created blogs (representing 33% of readers). Blogads blog reader survey (2005) claims that readers seek news they cannot find

anywhere else as blogs give them a better perspective. Reaching customers at the peak of interest, when they are searching for relevant information online through blogs, is an opportunity that cannot be missed by businesses these days.

Information provided by the Marketleap Link Popularity Check (2006) allows contemporary users to see the modern trend of blog content development: link popularity shot up from 20 to 1,212 for Timeshare owners' blog. According to Ranking-Manager, (2005) blog's top rankings have shot from 0 to 93 in Google, Yahoo and MSN.

Evans (2006) from MSN Canada refers to the following reasons every online store should blog: get early feedback on product ideas to engage customers, to improve credibility by demonstrating expertise, to influence the perception of your company and to improve search ranking.

Pollit (2005) describes search engine policies in response to commercial blogging and spamming and provides some statistics on "splogs" (a splog is a spam or fake blog created to achieve a high search engine result). He claims that the splog issue has grown quickly and nobody knows how many there are. Tracking service Technorati, which follows 20 million blogs, says up to 8% of the 70,000 blogs created every day are fake. Feedster blocks thousands a day while Splogspot.com publishes a weekly list. The latest shows 41,000, of which 34,000 are on Google's free Blogspot hosting service. In response, search engines try to fight spam blogs. According to Goldman from Google (2005), search engines lose money both on the hosting and infrastructure side for Blogger as well as on the AdSense side with spam prevention.

Moran & Hunt (2005) suggest several techniques to avoid in order to build effective search engine optimization practices: blog spamming, guest book spamming, link farms

participation, hidden links, link e-mail spamming and fake two-way links. As the search engine specialists become smarter so do the search engines that are harder to fool.

Technorati Weblog (2006) and Google Quality Guidelines attribute marketers' success of blogging to the ability to create feeds and blogs for users and not for search engines. A good rule of thumb is whether a marketer would feel comfortable about the posting before a competitor, blogger, journalist or customer. Fishkin (2006) lists several latest Blog Search and Social Tagging Engines: Digg, Del.icio.us, Reddit, Furl, Shadows & StumbleUpon as well as Technorati, Bloglines, Blogniscient and other blog search engines.

Targeting the right market by demographics and behavior is another important aspect of search engine marketing in opinions of many theorists and practitioners. Slegg (2006) from JenSense.com emphasizes the difference between demographics and behavioral targeting saying that behavioral approach targets users based on specific sites or pages within a site visited and determines user interests from the content on those pages.

Lee (2006) from Did-it.com believes that top listings drive volume in Google, MSN, Yahoo and the rest. Position delivers scale, and targeting can help the marketer to afford higher bids against the right audience. Lee (2006) is sure that identification and exploitation of power segments is one of the key tasks of every online business. Did-it.com brings in an example of MSN that adds increased targeting options by allowing marketers to raise their bid (bid boost) by demographics – age, gender, income, geography. Dayparting and daily scheduling is another option that can help marketers and may serve as an additional targeting. Targeting strategies allow reducing waste, targeting the best customers, increasing profit, improving messages and offers and being more aggressive when it matters.

New Media Age (2006) claims that Google is also market-testing demographic targeting for its AdWords paid search service to counter the threat from MSN Search's AdCenter product. Users of AdWords targeting the US can select up to five demographic categories. These are matched against sites in Google's Network that are popular with the chosen audience, according to data from ComScore Media Metrix. The tool offers the ability to segment by multiple demographics, such as sites popular with high-earning men.

Figallo (1998) looks into how communities of Website visitors and buyers change over time. The author claims that communities are living entities, subject to influences from the rest of their world, capable of changing in dimensions and dividing into sub-communities. This trend will consequentially lead the marketers to always change their marketing instruments for e-commerce. Almost all the professionals in the area of search engine marketing pay tribute to measuring Website success which empowers online marketing.

Kerin (2006) agrees with the general opinion of researchers, theorists and practitioners saying that measurement's value is the power to drive smart and timely decisions. Any online matrix can be measured these days. Without it, the marketers are flying blind. Friedlein (2003) lists more effective marketing, improved customer retention, and increased sales, automated site performance management among promises of Website management. On the other hand, there are some challenges listed. Among them are information overload, data quality, few common standards or metrics and many others. The author declares that E-metrics quickly moved on as the market turned away from a volume-based, market-share approach to more of a focus on revenues and profitability: Along came conversion ratios, average basket size, browse-to-buy rates, customer acquisition costs, and the like. E-metrics continue to evolve in the quest to use

business intelligence to make better tactical and strategic decisions, to out-innovate and out-manage the competition.

Moran & Hunt (2005) and Dickinson (2006) from British Petroleum agree that the following categories are crucial for understand and measuring success: counting conversion, counting visitors, and counting dollars. Counting conversion is a critical measurement because every commercial organization must be aware the number of people converted from a mere visitor to someone having a new relationship with the organization (a customer, a lead, a donor, and so forth). Friedlein (2003) notices that in Customer Relationship Management there there is a fundamental shift toward a customer-centric economy. This means that metrics and key performance indicators (KPIs) are evolving to have more direct relevance to customers. They are increasingly perceived to be a company's most important asset. So the metrics that many Websites are working toward focus on who a customer is, what that customer's attributes and preferences are, what segment that customer belongs to, how valuable that customer is to the company, and how that customer feels about the company. Weatherwax from Global Strategies International (2006) suggest that arrival to one's Website is already considered an action. He claims that most actions fall into two categories: a time visitor spends on the site and the information visitors provide about themselves.

Just knowing the number of conversions does not tell enough. What a marketer really wants to know is what percentage of visitors is converted. One can figure that out only by carefully counting visitors, too. Counting dollars is the most persuasive thing as it shows the extra revenue the online store earns due to search engine marketing. One can learn to translate into dollars the impact of every visitor who converts, using those dollars as justification for

search marketing efforts. In addition to conversion rates, the authors believe that counting traffic is a matter of vital importance. The most fundamental metric in Web measurements is the page view, a count of how many Web pages have been shown to Website's visitors. Web metrics reports always summarize page views for a particular time period, so that the marketer can see how many page views occurred in a day, a week, or a month. Weatherwax (2006), however, places limitations on online traders' expectations in terms of traffic. He asserts that there are three limiting factors that will limit online store's success: there is a finite amount of demand for words important to one's business, there is a finite amount of relevant content supporting these words, and a finite range of searcher intent.

According to Moran & Hunt (2005), more interesting than analyzing page views is examining just who is viewing those pages. Most Web metrics programs can identify a series of pages that have been viewed by the same visitor, by using cookies. The Web metrics program reads the identifier from the cookie file each time a page is viewed and remembers which computer viewed that page. While measuring the search marketing success three most important metrics must be taken into account. These are targeting the first campaign, assessing the current situation, and calculating opportunities.

Reynolds (2004) suggests that online store marketers use existing software that can be helpful with various analyses. As an example the author reveals amazing opportunities of the software called Webceo (www.Webceo.com) that provides a unified workspace for nine programs that can help a Website operator to attain real results in search engine marketing, to perform intelligent Web traffic analysis, and to maintain Website easily. Brusha from

www.acoupleofchicks.com (2006) claims that the use of Web analytics in marketing contributed to a 70% increase in direct online revenue within just one year.

Kendler (2006) describes success that banks have with measuring the performance of online initiatives. The case studies for 2006 demonstrate that banks effectively tie their keywords to a specific goal (e.g., tying the keywords "mortgage loan" to an ultimate goal of a loan application). Using this as the base of the campaign, banks evaluate the cost per click for the keywords and measure it against the total search-sourced conversions on their Website to arrive at an effective ROI. Banks focus on sourcing the maximum traffic by using keyword and creative tactics such as ad copy and landing page design that will drive this conversion. Banks also concentrate on the integration of search. Besides, an effective research program should involve actually capturing the attitudes and behavior of prospective customers as they interact with the bank's Website - and should include comparisons with industry-leading competitors. Dudley from WebsiteBiz (2006) declares that performance of a search marketing acquisition-oriented campaign typically includes a cost-per-account or cost-per-lead metric. Some marketers that are just launching their search marketing initiatives may use a cost-per-visitor metric in conjunction with a click-through rate. At the end of the day, the value of a visitor is only as good as the number of visitors that accept an offer, apply for an account, and are approved. Another key performance indicator is lead generation where you are monitoring the quantity and quality of customers successfully completing banks' call to action. To ensure that the content resonates with the target audience, typical Website KPIs - such as unique visits, repeat visitors and organic keyword referrals - provide the most-effective methods for monitoring success.

Mahaney (2005) informs anxious online marketers about the time lag between Google finding new Websites and when it actually starts ranking well. An unofficial term to describe the degree of difficulty that new sites typically experience before gaining meaningful traction within Google rankings is called the “Sandbox.” By making it difficult for new sites to rank highly for the first six to 12 months they are online, Google radically diminishes the effectiveness of aggressively optimizing a new site to get it ranked quickly. The author claims that not all new sites are affected by the Google Sandbox. According to searchengineneeds.com (2006), Google appears to be applying a number of filters that measure things like the rate at which new links are added to a site (to sidestep the Sandbox, the gradual approach is best), the degree to which those links come from a variety of IP addresses (a wide range of IPs is preferable), and the degree to which those links have identical anchor text (the marketer should try to vary anchor text somewhat). Google has stated that the sandbox effect was actually an unintentional byproduct of various filters that Google had in place. In other words, Google never planned to prevent all new sites from ranking well for the first year or so; they simply have an algorithm that favors older sites, quality, trusted backlinks, and will penalize sites for adding links too fast if it looks like those links are designed to manipulate their search results (i.e. lots of reciprocal links, paid links, etc.). These factors make it challenging for a new site to rank well. However, under certain conditions, such as when a site receives massive promotion and publicity, it can easily avoid the Sandbox. The example of such a recent phenomenon is <http://www.milliondollarhomepage.com/>. A student selling advertising on his page for \$1 a pixel was talked about everywhere on the Internet.

Method

Choosing the Right Domain Name

This study will investigate the following research questions: Does the right domain name make a difference in online store success? Do the onlinestores have to differentiate domain names for customers and search engines?

According to <http://www.SearchEngineNews.com> (2006) "If your intention is to build a long-term online business, then you are better off choosing a short, catchy name that will be easy to market, both online and off." In March 2006 the name of online store www.thelightingdivision.com was chosen. The reason for this selection is that whenever another site links to the site; we want them to use our keywords in the visible text of their link (anchor text). Additionally, with regard to visitor click-throughs, having our keywords in our domain name can make a big difference. When browsing through lists of links, people are more likely to click on domain names containing the keyword they are searching for.

In order to get the name that is easily recognizable and remembered in August 2006 it was suggested to add another domain name www.tled.com (www.tld.com domain name has already been taken). It was decided to separate our keywords by dashes to make them easier for the search engines to read. The domain name www.thelighting-division.com will make it possible to save time on parsing every possible word found within that domain name. (Double dashes in the domain name like www.the-lighting-division.com looks tacky and many search engines will not index sites with double dashes in the domain name)

The primary drawback is that domain names with dashes are harder for the customers to remember. They can be more difficult to convey by word of mouth since people have to say “the lighting dash division dot com” instead of just “the lighting division dot com.”

For the purposes of addressing misspellings, we registered www.thelightingdivision.com, www.thedivisionlighting.com, www.thedivision-lighting.com, www.thedivisionlighting.net, www.thedivisionlighting.biz

Choosing a domain name extension is an important factor. We registered www.thelightingdivision.net, www.thelightingdivision.biz still understanding that our .com domain names will attract most of the audience. By registering all possible keyword-combination domain names we will have them available for our company when needed, but it will also prevent our competitors from securing and using them against us.

Here is the list of domain names:

www.thelightingdivision.com

www.thelighting-division.com

www.tled.com

www.thelightingdivision.com

www.thedivisionlighting.com

www.thedivision-lighting.com

www.thelightingdivision.net

www.thelightingdivision.biz

www.thedivisionlighting.net

www.thedivisionlighting.biz

www.lightingdivision.com

www.lightingdivision.biz

www.lightingdivision.net

www.lighting-division.com

www.divisionlighting.com

www.division-lighting.com

www.divisionlighting.biz

www.divisionlighting.net

Designing the Website

What design components matter? What is a checklist necessary for fulfillment?

- a) Making sure that HTML code is correct and well-formed. According to

<http://www.SearchEngineNews.com> (2006) the best way to make sure that HTML code is easily processed by a spider is to have the code comply with the standards laid out by the World Wide Web Consortium (W3C). It is necessary to test pages with an HTML validator <http://validator.w3.org/>. It will be able to tell if the spiders will be able to process pages without any trouble.

Every page needs to be tested by ways of utilizing validator mentioned above.

- b) Our pages should have a valid DOCTYPE. There is evidence that standards-compliant pages with valid DOCTYPEs are generally easier for search engine spiders to parse and they are also easier for browsers to process.

The first line of code should read: `<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" http://www.w3.org/TR/html4/loose.dtd ">`

In order to achieve this result it is necessary to convert the existing html code into HTML 4.01 transitional (In Dreamweaver 8.0 this is done by selection of file-convert-choose from the list HTML 4.01 Transitional). This exercise is to be repeated with every page of the lightingdivision Website.

- c) URLs should be simple. They should not be dynamically generated URLs as they contain lots of strange-looking characters, such as ?, &, +, and, =. Instead static-looking URL should be employed. They are also easier on the eyes. (Appendix A).
- d) A flat directory structure should be employed. Pages that are several subdirectory levels deep will often get spidered less frequently. All the pages should be only two or three levels deep, that way it is easier to logically organize them.

The Lighting division Website has depth of 3 levels.

- e) Using a site map. A site map is a Web page that links to every other page within the site. Once it is created, it ensures that each page of the site is only one click away from the site map and only two clicks away from the home page. This is the optimum structure in terms of making Web pages easy for the search spiders to find.

The Lighting Division Website has both a vertical and horizontal structure.

- f) Get Robot.txt file in shape. Robot.txt files are used to tell search engine spiders which pages not to index. It is necessary to tell a search engine not to index some pages of the Website because search engine spiders function with limited time and resources when indexing sites. The site will be better served by focusing on getting “important” customer-development, product, and sales pages indexed. There is no need to index

shopping cart checkout pages show up in the search engine results. There is also no benefit in having images or pages with images in the search results.

(Appendix A explains which pages are subjected to indexing and which are not)

- g) It is necessary to keep each page under 101k. Page loading time is an important factor. The larger the image size, the slower the page will load for the visitors. The upper limit must be 100k since Google indexes the first 101k of an HTML page.
- The Lighting Division contains 34 pages, each one of them should be checked for the size. It cannot exceed 101k. File info can be obtained through the File Manager in Panel X (hosting company).

Writing for the Web

According to <http://www.SearchEngineNews.com> (2006) there are three main questions to be answered when searching for the keywords:

- 1) What they are;
- 2) How to find them;
- 3) And what to do with them once they are found.

1) General approach and tools:

In working with the Website www.thelightingdivision.com it will be necessary to obtain a list of keywords that are not too general as that means stiff competition from other lighting Websites that have already spent enormous amounts of time and money to secure top positions for such general keywords. General keywords are so broad that they could apply to all kinds of lighting products. At the same time, when looking for keywords that are too specific to our business niche, sometimes these keywords can be too specific. Keywords optimization must be

adjusted to those keywords that potential customers would know and use. It is necessary to find keywords in the middle of these two extremes. For this purpose it is suggested to use the following tools:

<http://www.wordtracker.com/trial.html> and the software called Good Keywords. (Appendix B provides a list of keywords for every page)

2) Putting ourselves into customer's shoes by asking: What problem does my product solve for my typical customers? Keeping customers' perspective is an important task.

Separating customers into two main categories (industrial and residential) helps in understanding the use of keywords (Appendix E). Residential customers should be talked to and asked about the keywords that they might be using for the lighting products they seek.

Customers that buy for their home's purposes tend to use more general and even broader words while corporate customers tend to know more since they are industry insiders.

Industry articles from Proquest must be used to familiarize ourselves about keywords and most common topics that are discussed by the professionals in the sphere of lighting products.

Identifying keywords through the referral logs (tell us what keywords searchers use to find our Website).

- 4) What is competition doing about search engine marketing? For this purpose it is necessary to make a list of the most popular words that are discovered by the software search (step 1 of the present section).

It is suggested to use 30 keywords to discover more keywords through competition search.

Existing/known keywords	Competitor's Website	Newly discovered keywords

5) Cover all keywords variations.

It is useful to look for variations on keywords that might be successful. This includes misspelling, plurals, synonyms, merged words, or keywords separated-by-hyphens.

Ex. Light, lights, lighting, liting, darkroom lighting, dark room lighting, light fixtures, light fixture, lighting fixture and etc.

Basic keyword	plurals	Synonyms	Merged words	Keywords separated-by- hyphens

6) Be descriptive

Once all the variations of the most important keywords have been identified, it is necessary to begin adding descriptive terms to augment existing terms. This may include terms that describe a problem. Superlatives may help a lot. Reverse descriptive words, or words that describe the opposite of what our products do, can work to our advantage. This happens when a person typing a query has a problem that they are actively searching to find a solution to.

Basic keyword	Descriptive term	Superlative of a descriptive term	Reverse descriptive words
LED lighting	Low-voltage,	The most	Traditional

	cost-efficient	cost-efficient low voltage lighting	lighting, conventional lighting, incandescent lighting

- 7) Use action words like “buy, find or purchase”
- 8) Target local markets. It is recommended to mention the location in the text at every opportunity. Relevant place names can be added to keyword list. With this purpose in mind The Lighting Division has its local Rochester address on every page. In the galleries, The Lighting Division utilizes local names such as Sodus, NY, Rochester, NY.
- 9) Online Keyword tools to complete keywords selection. With free search term suggestion tools (that are skewed to enhance pay-per-click ad revenues) such as Yahoo’s tool located at:

<http://inventory.overture.com/d/searchinventory/suggestion/> we will receive a search count of that keyword with the Yahoo network during the previous month. It is also possible to get a list of related words and the frequencies with which they were queried over that same period of time. The Google’s free version of their search term suggestion tool – called the Google AdWords Keywords Tool - is located at:

<https://adwords.google.com/select/KeywordsSandbox>

Keyword placement

The most critically important location to place keywords is within Website page's HTML <title>tag. Search engines view the keywords found in the title tag as extremely important since they tell the engine what the site is about. Therefore, it is critical to place the most important keywords within <title>tag. Appendix B describes the keywords in the title tags that were used for The Lighting Division Web pages. According to <http://www.SearchEngineNews.com> it is recommended to limit title tag to less than 60 characters (usually 7 to 10 words). Anything longer may lead to a risk of getting part of the title chopped off by some search engines. Keywords in titles competition are demonstrated in Appendix C (Keywords in titles). The short cut to help us find all the other Web pages that are using our keywords in their titles. Intitle: "title keywords."

Header tags

After the titles, Web page's header tags are the most important placement for your keywords. Header tags are specified with the following HTML code: <h1>, <h2>, <h3>, <h4>, <h5>, <h6>. Generally speaking, an <h1> tag is considered to be more important than <h2> tag which is more important than an <h3>tag, and so on. Header tags for www.thelightingdivision.com are identified in Appendix B (column 3).

Body text

Pages <body> text refers to the visible text on the page. While it is very important to place keywords in page titles and headlines, it is also beneficial to feature keywords throughout the rest of the page.

Generally, Web pages should have about 200-300 words of text with special emphasis on two or three carefully chosen words. Within this keyword-rich <body>text, search engines respond favorably to keywords placed within style tags such as, , , <i>, , . The Lighting Division Website contains keywords listed in the Appendix B. The number of words per page ranges from 58 to 540 with the number of keywords from 1 to 46.

Link Anchor Text

Link anchor text refers to the visible text in an HTML link. Keywords placed in the anchor text of links on the web pages are given a higher priority by most search engines. Anchor keywords for the Lighting Division are outlined in the Appendix B (column 4). The Higher up on the page, the better. It is very critical to place some of the best-known keywords-rich text as high up on the web page as possible. That is because search engines index page content (via the utilization of source code) in linear order and give priority to keywords found closest to the top of the web page. For this reason in the company mission statement The Lighting Division Website contains such keywords as “lighting”, “modern lighting products”, “Rochester, NY” at the very beginning of the page.

Meta tags

Meta tags are non-displayed text written into HTML document intended to describe any page to the search engine for the purposes of cataloging the page content. The meta description tag should absolutely be included in every web page document that needs to be described on the search engine result page.

The meta description tag is used by many search engines as the summary description of the page whenever listed in the search results. It helps the searchers decide whether or not the

page is relevant to the search. It is what compels (or not) a real person to click or not to click on the link. If the meta description tag is omitted, then the search engine is likely to fabricate a description of the site based on arbitrary text gleaned from somewhere in the page.

Another possibility is that the search engine will omit the summary description entirely if it fails to find something useful within the page to use as a summary. It is advisable to avoid repeating keywords, use only keywords that are relevant to the theme of the Website.

Titles for the web pages	Meta names and content
index (home page)	<p>Meta names: "light emitting diode (LED), LED technology, task lighting, accent lighting, decorative lighting, low cost lighting, long life lighting, safety lighting, fiber optic solutions, LED solutions, garden lighting, landscape lighting."</p> <p>Content: "indoor illumination, energy saving light products, low voltage light products, lighting design", lighting style, residential lighting, industrial lighting."</p>
company index page "about us"	<p>Meta names: "Photography, darkroom environment, LED lighting, photo industry, LED Lighting Solutions, Fiber Optic Solutions, Home Lighting, garden</p>

	<p>lighting.”</p> <p>Content: “directional lighting, lighting for walkways, safety lighting, lighting ideas, multi-colored light emitting diodes, stage lighting, medical lighting, accent lighting, task lighting, florescent lamps, electricity costs, hospital lighting, energy saving lighting.”</p>
History	<p>Meta names: Light emitting diodes (LED's), dark room lighting, solid state lighting, subdued lighting, eye adjustment, fiber optic,</p> <p>Content: darkroom, energy efficiency, safety</p>
Management	<p>Meta name: manufacturing, production, mechanical assemblies, engineering.</p> <p>Content: lighting, LED, global sourcing</p>
News	<p>Meta names: NY State Fair</p>
Privacy terms (non-disclosure agreement online)	<p>Meta name: lighting division and information security of lighting store.</p> <p>Content: secure online lighting store</p>
residential applications	<p>Meta names: residential lighting, home</p>

	<p>illumination, landscape illumination, artificial light evolution, LED lighting, night sky, lighting technology, energy efficiency, conventional lighting.</p> <p>Content: boat interior, boat exterior, pool lighting, Fiber optic.</p>
home and garden	<p>Meta names: Fiber optic, LED technology, lighting techniques, garden illumination, yard illumination.</p> <p>Content: Lighting kit, accent lighting, directional lighting, home decorations, garden decorations</p>
Boating and docks	<p>Meta names: Lighting for boats and docks, LED technology, fiber optic, luminaries, sailing and boating, novel lighting equipment, low voltage, home safety, elegant lighting, night sky, mariners.</p> <p>Content: light intensity, light fixtures, traditional lighting.</p>
Pool lighting and pond lighting	<p>Meta names: residential lighting, pool lighting and pond lighting, pond landscape, pool</p> <p>Content: landscape, pool design, pond</p>

	design, low voltage, fiber optic, safety, security lighting, lighting kit.
Signage	Meta names: LED signs, solid-state LED technology, exterior signage, interior signage, lighting fixtures, electricity costs. Content: luminaries, fiber optic.
Industrial applications	Meta names: industrial lighting, darkroom lighting, path lighting, task lighting, subdued lighting, fast eye adjustment. Content: stage lighting, safety lighting, low voltage LED lighting, fiber optic cable, luminaries, illumination intensity, hospital lighting, good night sleep, conventional overhead lighting, restaurant lighting, lighting design, accent lighting
Darkroom lighting	Meta names: industrial lighting, darkroom light, fiber optic, light emitting diodes, LED, human eye, visibility, night vision, light intensity, safe lights, low voltage, cost-efficient lighting, low voltage, overhead lighting, fiber optic, path lighting. Content: durable lighting

Safety and Stage Lighting	<p>Meta names: industrial lighting, stage lighting, safety lighting, energy efficient lighting, solid state lighting, fiber optic, low voltage, lighting for walkways, theaters, theatres, stage scenery, stage hands.</p> <p>Content: indirect lighting, safety light, accent lights, primary lighting colors.</p>
Medical applications	<p>Meta names: Medical lighting, industrial lighting, fiber optic, lighting for hospitals and health care facilities.</p> <p>Content: light emitting diodes, fiber optic, sleep patterns, bright overhead lights, low voltage, traditional lighting</p>
Restaurant lighting	<p>Meta names: industrial lighting, restaurant lighting, light, lights, lighting, interior designers, accent, restaurant architecture, interior design, light emitting diodes.</p> <p>Content: LED's, decorative lighting, fiber optic, electricity costs reduction, lighting kits, light intensity, lighting products</p>
Products index page	<p>Meta names: Lighting products, lighting</p>

	kit, light case, fiber optic, light colors, industrial fiber optic lights, stealth light, silicone adhesive sealant.
Lighting kit page	Meta names: Lighting kit, fiber optic cable, fiber optic track, power supply, shrink tubing, power splitter, silicone adhesive sealant, handi-cut, light spectrum, UV-protected.
Light case	Meta names: Light, lights, lighting, liting, lighting case, lighting kit, light colors, color spectrum, fiber optic, dimmable lighting capabilities, low voltage, cost effective lighting
Fiber optic cable (FOC)	Meta names: Lighting products, lights, light, lighting, liting, low voltage, cost-efficient lighting, fiber optic cable, fiber optic track, UV-protected. Content: modern lites, conventional lighting, LED technology
Fiber optic track (FOT)	Meta names: Lighting products, lights, light, low voltage, cost-efficient lighting, liting, flexible lighting.

Industrial fiber optic light (IFOL)	Meta names: Industrial Fiber Optic Light, lights, lighting, liting, lighting products, dimmable lights.
Stealth Light	Meta names: lights, lighting, light, light products, low voltage, light case, power supply, dimmable lighting, kitchen lighting, home lighting, color spectrum, accent lighting, task lighting.
Lumacord	Meta names: light, lighting, liting, fiber optic cable, rope, visibility, dark, safety lighting, water, garden, yard, hazardous elevations, night sky, light fixtures, low voltage, low electricity consumption, lighting style.
Galleries index page	No need to index
Dock Lighting and Boat Lighting	No need to index
Restaurant lighting	No need to index
Darkroom lighting	No need to index

Home Lighting and Garden Lighting	No need to index
Pool lighting and pond lighting	No need to index
Customers' testimonials	Meta names: customers, testimonials, lights, light, lighting, Rochester, New York, restaurant
Buying from us	No need to index
Contest	In process

Use the <Images Alt=""> Tag wisely: Turn images into assets.

As the only indexable aspect of images is the text content that may be placed within the <image alt=""keywords"">tag.

Recent algorithms are built in such a way that they do not boost Website ranking from this strategy but before, they were known to index the content of Alt tags. To be on the safe side, it is better to consider inserting keywords into images alt tags.

There are three more reasons for using alt tags:

- 1) The content becomes visible when a mouse passes over the image,
- 2) The content appears whenever the image fails to load;
- 3) HTML specs require that image to have an Alt tag.

The Lighting Division web pages are built in such a way that alt tags are used for keywords already identified and known. The way to know what keyword is attached to what image, it is necessary to pass the mouse over the image.

Titles for the web pages	Image ALT titles
index (home page)	Led lighting
company index page "about us"	LED and fiber optic
History	Light emitting diodes
Management	LED and fiber optic, lighting ideas, engineering ideas
News	LED light,
Privacy terms (non-disclosure agreement online)	Modern lighting
residential applications	Garden lighting
home and garden	Residential lights
Boating and docks	Lights for boats and docks

Pool lighting and pond lighting	Pond and pool lighting
Signage	LED signs
Industrial applications	Industrial lighting
Darkroom lighting	Darkroom lights
Safety and Stage Lighting	No images on the page
Medical applications	No images on the page
Restaurant lighting	Restaurant lighting
Products index page	Lighting products
Lighting kit page	Lighting kit
Light case	Light case
Fiber optic cable (FOC)	Fiber Optic Lighting

Fiber optic track (FOT)	Fiber optic lights
Industrial fiber optic light (IFOL)	Industrial lighting
Stealth Light	Garden lights, roses and LED lights, stealth light, home lighting, stealth light kit
Lumacord	LED and fiber optic
Galleries index page	No index needed
Dock Lighting and Boat Lighting	No index needed
Restaurant lighting	No index needed
Darkroom lighting	No index needed
Home Lighting and Garden Lighting	No index needed
Pool lighting and pond lighting	No index needed
Customers' testimonials	In progress

Buying from us	No images
Contest	In progress

Keyword density

Keyword density refers to the number of times a keyword appears in relation to all of the other words on the same web page. Search engines ignore common words such as the, at, of, etc. Before, there used to be a “magic formula” for calculating the optimal keyword density that will appeal to each search engine. While this was true in the past, it has largely ceased to be the case. The concept of keyword density does not take into account the location of the keywords on the page. Keyword placement is an important element to optimize for search engine ranking. It is critical to take into account whether those keywords are featured in title tags (Appendix C), link anchor text, or any other important places to feature keywords.

The distance between keywords on a page, called keyword proximity is equally significant. In general, the closer keywords are to each other, the better. In sum, such a large degree of variation makes it all-but-impossible for anyone to determine just exactly what the ideal keyword density actually is. The most effective search engine optimizers use keywords in way that look natural and don't waste a lot of time stressing over the exact number of times a keyword should appear on the page.

For The Lighting Division exercise (Appendix B) that encompassed keyword density calculation showed that the keyword density for every page by itself is quite insignificant. However, it does not stop the developers to continue with their search engine optimization

practices that cover keywords inclusion into strategic elements from the web design perspective. Keywords calculation methods is a close approximation because the researcher used the word document word count tool to calculate the total number of words per page. The researcher did not exclude articles and common words that the search engines do not take into account. The reason for such approach is: it is not necessary to know exact keyword density percentage to get a high ranking with various search engines.

Link Building

Link value is passed from page-to-page, not from site to site. It is not possible to get a link from a site-it is only possible to get a link from a page. Search engine ranks pages based on the page, not on the site. Links comes from a specific page with a site not the whole site in general. In the past, many search engines ranked pages based on the sheer number of links pointing to them. This was known as Link Popularity. The reasoning was that good pages attracted lots of links. At that time, it was a pure number game – the more incoming links, the better. Unfortunately, this made search engines fairly easy to manipulate. It encouraged sites to acquire large numbers of links from low-quality sites, such as link farms, or through aggressive reciprocal links campaigns, in order to game the link popularity ranking method.

Now search engines evaluate links based on importance. There are a few ways to establish web page as important:

1. Get tons of links;
2. Get a few links from other important pages;
3. Use both 1 and 2;

Important pages are those that attract many incoming links. Not all the links are equally important. Not all links are equal; few links from important pages can do far more good for page ranking efforts than many links from unimportant pages.

Page rank and the Google Toolbar

The page rank feature of the Google toolbar gives a rough idea of how important Google considers a page to be – making it a useful tool when deciding which pages to get links from. As a general rule, it is recommended to get links from pages with the highest tool bar PageRank possible (the closer to 10, the better). Among other factors of vital importance search engines identify site's popularity and reputation within its industry, how similar in topic the site is to our Website and the overall quality of the site itself.

The exception to this rule should be made in case of sites that have a toolbar PageRank of zero, or where the toolbar appears completely gray. While these just indicate that Google hasn't gotten around to assigning Page Rank yet, they can also be a sign that Google has penalized the site. To be safe, it is best to avoid linking to or being linked from such pages.

For the Lighting Division project the web page of Arizona State University explaining what is inside LED (light emitting diodes) came relevant. Google ranked it 6-7 on the page rank scale. It is also known that research information from the educational establishments is ranked higher by the search engines and is known to be more reliable and trustworthy. Besides, it explains to our target audience the essence of the light emitting diodes on one page without going too much into lighting technicalities.

<http://accept.la.asu.edu/courses/phs110/expmts/exp13a.html>

Another outgoing link leads to www.qcacorp.com. – the web page to the parent company of The Lighting Division. This link is not expected to raise the visibility of The Lighting Division web page as QCA page is rated 3 on the Google Scale.

Our product pages are connected to the link

<http://www.handprint.com/HP/WCL/color1.html#top> in the section where primary and secondary colors produced by LED's are described. Although this page ranks 6 on the Google page ranking scale, it gives audience with different levels of knowledge about the depth of lighting, physics and engineering a basic level of knowledge and enables this audience to see the secondary colors that are possible to get while mixing primary colors of light emitting diodes. The outgoing link to http://www.fpl.com/business/savings/energy_advisor/CEA_04.html provides restaurant owners and interior designers of the restaurant with the information about general costs of doing business in restaurants. The page is ranked 4 on the Google scale but to the Lighting Division it is vital to show that there is a need of reduction electricity costs and it can be done by adoption of LED lighting. With time, it will be necessary to keep track of better ranked web pages that give accurate and impartial information.

Linking to www.ups.com is relevant because a well-known shipping company has high ranking (of 8) with Google and is essential in providing our potential customers with the information about deliveries, tracking and customs rules and processes.

At this stage we acknowledge that not enough was done regarding outgoing linking to relevant sources of information. Incoming links have not been finalized at this point but the linking work is significant and cannot be underestimated or ignored.

The Reciprocal Link

The reciprocal link was the link-bread and butter of the search engine optimizer. Times have reduced its influence but reciprocal linking still yields benefits. Today reciprocal links are not worth as much as one-way links. Search engines can easily detect and discount reciprocal links, greatly reducing their effectiveness. The recommendation that is heard from various sources is such that no more than 25% links should be represented by the reciprocal links. However, the reciprocal links should be related to the topic of our own. The link between www.qcacorp.com (assembly of engineering equipment and parts) and www.thelightingdivision.com , a unit of QCA (manufacturing, sales and distribution of lighting equipment) may be interpreted by the search engines as relevant because they both deal with engineering products of some kind. These two links will not be seen as two unrelated Websites that have no common topic. The primary reason to get a reciprocal link is for the traffic it will send to the site.

Finding reciprocal link partners

The best way to start conducting a search for the link partners is by inserting our keywords in each of the major search engines. It would be ideal to do reciprocal link swaps because these high ranking pages will likely to be receiving large numbers of the same kinds of visitors our Website is looking for. If they link to our Website, there is a high chance that they will be sending some of that traffic to us.

Another tool is to use the Google directory to find sites related to our Website, arranged by PageRank. It can be very helpful when choosing partners. Ideally, we will be interested in the Websites that with as high as possible Page Rank so it is crucial to find a category and work our way down the list.

Directories for light emitting diodes (from only 2 first Google pages) will be:

http://www.macraesbluebook.com/search/product_company_list.cfm?Prod_Code=4346400

MacRae's Blue Book – industrial directory of Yellow pages.com

http://www.ledmarketplace.com/LED_Product_Directory.htm

Ledmarketplace is a directory with the information about companies that provide a light emitting diode related product or service

http://www.business.com/directory/electronics_and_semiconductors/electronic_components/electronic_display_devices/light-emitting_diode_led/ - a marketplace for designers, manufacturers and distributors of light-emitting diode display devices.

http://optoelectronics.globalspec.com/Industrial-Directory/light_emitting_diode Global spec - the engineering search engine.

<http://www.thomasnet.com/products/displays-light-emitting-diode-led-23494909-1.html>

Industrial resource of information that has a list of 160 companies that are related to manufacturing of light emitting diodes.

<http://www.powersourcing.com/se/lightemittingdiodes.htm> PowerSourcing is the source for finding light emitting diodes suppliers.

Some of the Websites will be in direct competition to our Website, so they may not wish to provide us with a link. However, some will and it may be beneficial to ask. In general, there may be more benefit to contact the Websites that compliment our Website, as opposed to the sites that compete with ours. In our case, if our Website sells LED lighting equipment, a site that sells incandescent and florescent fixtures could be a good partner. After all, both sites sell lighting equipment but don't directly compete with each other. Another idea is to look for the sites that

do not sell exactly what we sell, but instead sell a compliment to our products and also rank high for search phrases that are related to our keywords and phrases.

Finally, once we find the top ranking pages for the keywords that we identified in each search engine, as well as Google directory, it is necessary to find pages that are linked to them. In Google, Yahoo, and MSN, it is necessary to search for:

Link:<http://www.some-site.com> (where some-site is the name of the site we are interested in linking). At this stage there are no links that are linked with The Lighting Division.

However, the experiment with MSN demonstrated that there is much truth in the theory above. MSN showed that QCA corp (the parent company of The Lighting Division) is connected to www.myrochester.com directory that contains a link to www.qcacorp.com

By the same token the best partners can be identified and pursued regarding reciprocal linking. This process will help assemble a very large list of potential link partners to begin requesting links from. The key to success is to choose the highest ranked companies and work the way down the list.

Sending out our own link request

Once the link of potential partners is completed, the next step is to contact them to request a link exchange. The rate of success is the highest when one uses a phone or an e-mail and when the webmaster or online marketing departments are contacted. The best outcome of such communication can be achieved when the message is made personal, so that they know that the message is coming from a real person and not an automated script indiscriminately sending out link requests. The advice is to spend some time on the potential partners' Websites seeking

out the information of a real, live person. Whenever possible it is recommended to address this message directly to that person rather than a company or site name.

The search engine marketers suggest initiating reciprocal linking practice describing to potential online partners why such an exchange may come beneficial to them. URL and anchor text information will make it easier for them to make a decision and link to us.

If the companies that we are planning to correspond do not link to us right away, we would have to resend a request after a month or so and then wait another month. The e-mail has to be customized for our own site and writing style, and before long the idea of what people respond to will be grasped.

It is necessary to keep log of who was contacted and when. This will help to avoid duplicating efforts, as well as to make the follow-up process easier. Searchable databases of potential and actual link partners are a must to create and maintain.

Submitting the Website to links pages

Besides reciprocal linking, the other commonly used link building technique that was once popular but has faded effectiveness is submitting the site to links pages. There are a surprisingly large number of sites that would allow adding our link to their site with no questions asked. This is an easy way to get lots of links, which is exactly why these links tend to not be worth very much in terms of building an overall incoming link equity. After all, the engines already know that anyone can get these links; that is why they are usually called free for all pages. Therefore, it is not even worth putting much effort and trust into linking to such free for all pages that may be low quality sites, often completely unrelated to our own site's theme or

topic. The bottom line is: such links are unlikely to help for our pages to rank better and it is even believed that over the long run they may actually hurt the rating.

The essential strategy for building incoming links is to understand that the more inbound links a page has, the more popular it is. Search engines like popular pages. The challenge to the most Websites is to accumulate enough incoming links to appear relevant to the engines without tripping any one of the many spam filters and penalties that are applied to sites that cheat. Search engines like natural link structure where:

- 1) Inbound anchor text varies;
- 2) Inbound link count increases gradually. At the moment (August 19, 2006) the link-count for the Lighting Division is insignificant but it will increase as the company gets more involved into Internet Networking.
- 3) Site links to only reputable pages
- 4) Links are rarely reciprocal

The Lighting Division will pursue the natural linking scenario once the Website pages are submitted to the most popular search engines – Google, Yahoo, MSN, Ask.

Artificial link structure

- 1) Inbound anchor text is identical;
- 2) Inbound link count increases suddenly;
- 3) Site links out to link farms or web rings;
- 4) High percentage of links are reciprocal

The Best Place to start getting links

Rather than swapping links, the alternative of acquiring incoming links should be considered. The best places to start submitting our Website to Website directories of significance (Appendix D):

1) <http://dmoz.org/>

The categories in this directory where The Lighting Division will potentially be found are:

Business: Electronics and Electrical: Optoelectronics and Fiber (2 matches)

Science: Technology: Electronics: Reference: Semiconductors (2)

Business: Electronics and Electrical: Components: Capacitors and Resistors (1)

Society: Philanthropy: Organizations: International Assistance (1)

Shopping: Consumer Electronics: Accessories: Components (1)

(the number of companies in every directory is counted on August 19, 2006)

2) <http://dir.yahoo.com/>

3) <http://search.yahoo.com/search/dir?h=c&p=light+emitting+diodes> (10 results were identified on August 19, 2006)

4) <http://www.joeant.com/>

5) <http://skaffe.com/> 115 Websites are found in this category

6) <http://bluefind.com>

7) <http://botw.org/>

8) <http://www.goguides.org>

9) <http://gimpsy.com/>

10) <http://www.wowdirectory.com/>

11) <http://www.sevenseek.com/>

12) <http://www.site-sift.com/>

13) <http://sbd.bcentral.com/> Microsoft BCentral Small Business Directory

14) <http://www.avivadirectory.com/Directories/Directories/Directory-of-Directories/>

15) http://www.isedb.com/html/Web_Directories/Specialty_Directories/

In the attachment 4 more detailed information about the best directories to get listed are mentioned.

Non-traditional linking techniques

Figuring out where to get incoming links from is like solving a puzzle. It takes a little creativity coupled with formulas and patterns. Suppliers that we are doing business or professional organizations that we are involved in might be willing to list our company on their referral page. This is one of the areas that might be beneficial to test. The Lighting Division will start tracking its relationships with suppliers and then inquire about whether they are interested in linking to The Lighting Division.

Other ways to get incoming links are:

- writing articles about the products that we are producing;

- “Swap” links with a partner company that we closely do business with – or whose services compliment our own.

- Press releases about the company product launches, staff additions, promotions, partnerships, new services, etc. The engines quickly pick up press releases and the links contained within them.

Submit testimonials, along with the link to our Website, about products that we are enthusiastic about. If the testimonial is well written, the company (whose products are praised) will often post it on their site.

- Gaining incoming links is possible through forums that allow a text link to our site within forum signature. It is necessary to look for the subject we are knowledgeable about and we need to start posting asking and answering questions.

Finding out who is linking to our competitor's Website and convince them to link to us instead. Going to Yahoo search engine and inserting

linkdomain: www.ledtronics.com

provided us with a list of links that are incoming links to Ledtronics (a competitor). Yahoo identified 8,756 inlinks. As all the companies linking to Ledtronics are known (thanks to Yahoo), now it will be possible to contact the most well ranked representatives of the list and negotiate linking with them. The experts suggest even paying to the most reputable businesses to get those quality links.

Getting the Website listed

Recent research shows that there is no necessity to submit the site to Google as this search engine and many others prefer to find pages on its own through links from outside sites. In Google's eyes, such inbound links from offsite sources tend to legitimize a site's standing in the search results. For the new Website The Lighting Division it may not be an easy job to place a link from an existing Google listed site. The task is to find one: link building techniques as well as releasing a press release through PRWeb often works well to achieve this objective.

A very general rule is that the higher the PageRank of the site that links to us, the quicker the web page will be crawled by Google.

The entry procedure is exactly the same for Yahoo, MSN and Ask. Of course, getting into the index of any of the major search engines legitimizes our site in the eyes of the others. Once we have pages indexed in any of the search engines, we will have our own avenue of entry for new pages and sites. By simply placing links to these new pages from our own known pages, search engines will find them the next time they crawl the web.

Submitting our Website

According to Planet Ocean (2006) there is no reason to bother submitting our site to one of the major search engines – Google, Yahoo!, MSN, Ask. In regards to Google's AddURL, Google says: "We do not add all submitted URL's to our index, and we cannot make any predictions or guarantees about when or if they will appear". The best way to ensure that Google finds our Website is to have pages on other relevant sites to link to ours. Google's robots jump from page to page on the web via hyperlinks. So, the more sites that link to our pages, the more likely it is that we (Google) find them quickly."

The Lighting Division would have to work towards link building and working through offline Marketing programs and press releases to build new Website's web presence. As it is not an option for The Lighting Division to participate in Pay-per-click (PPC) online campaign with Google (<https://adwords.google.com/select/index.html>), it may be realistic to expect the longer our page is on the web, the more links it will accumulate and, therefore, the better Google will rank it. For now Google assigns relevancy to pages based on a proprietary (and continuously changing) algorithm that takes into account the following elements:

- incoming links
- page content
- page title
- keywords in URL
- link content
- PageRank score

Checking the status of our Website

To see which pages from our site Google has indexed , it would be necessary to type in the following in the Google search bar: site: www.thelightingdivision.com

To see which pages Google sees linking to any one of our individual pages:

link:<http://www.thelightingdivision.com/ourpage.html>

In Yahoo query we will enter:

Link:<http://www.thelightingdivision.com> to get the list of the Websites that are linking to us.

If we wish to find the links to entire domain, we will enter:

Linkdomain:<http://www.thelightingdivision.com>

To get an all-in-one screen experience of a site's incoming link strength, the following tool should be used: <http://www.marketleap.com/publinkpop/>

The Google Sandbox

The time lag between Google “finding” new Website and when it actually starts ranking well is called Google sandbox. It is good to know that such term exists. For the Lighting Division we are prepared to wait from 6 to 12 months to become recognized by Google.

The concept of sandbox, however, may be tricky and unpredictable because:

First, not all new sites seem to be affected. Of those that are affected, some are affected to a greater degree than others. The time it takes to be released from the sandbox varies from site to site (though observations indicate that Sandboxed sites tend to be released in large bunches all at once, rather than one at a time).

Second, just what determines a competitive search term varies in different circumstances. In some cases, a site can't rank for any keyword that returns more than 50,000 search results. Other times, it can't rank for any keywords at all. For Google sandbox is an effective spam-fighting tool.

It was noticed and recognized that Google applies a number of filters that measure things like:

the rate at which new links are added to a site (to sidestep the Sandbox, the gradual approach is best);

the degree to which those links come from a variety of IP addresses (a wide range of IP's is preferable);

the degree to which those links have identical anchor text (it is necessary to anchor text somewhat)

Yahoo search engine and Website submission

Within 30 days after Yahoo's spider finds a link to our Website. So, The Lighting Division still has a hope of being seen and crawled by the Yahoo's spiders and around October 1st potential customers will be able to find the online store through Yahoo! Possibly as soon as 14-21 days if we decide to submit pages of the Lighting Division Website via Yahoo's free URL submission:

<http://submit.search.yahoo.com/free/request>. However, it is not necessary because Yahoo will find our Website by ways of various links pointing to our Website.

Checking our web status in Yahoo:

To see which pages from our Website Yahoo has indexed, it is recommended to type the following in the Yahoo search bar: `site:www.thelightingdivision.com`

To see which pages Yahoo sees linking to any one of our individual pages:

Link:[http://www.thelightingdivision.com/path to our page.html](http://www.thelightingdivision.com/path%20to%20our%20page.html)

To see all pages Yahoo sees linking to any page on our Website as a whole we will try to work with: `Linkdomain:www.thelightingdivision.com`

Good plan for the Lighting products of The Lighting Division will be submission of our Website's product's pages via Yahoo's Product Submit page:

<http://searchmarketing.yahoo.com/shopsb/index.php>

Submitting a data feed is free; however, clicks on our products will be subjected to a cost-per-click amount and The Lighting Division will have to start with \$50 deposit.

Yahoo local offers a local search option at:

<http://local.yahoo.com>

Search results are compiled from the InfoUSA databases of businesses and Yahoo Yellow pages.

In a distinct difference from Google's local search, Yahoo seldom makes use of professional business reviews from the companies like Frommers. Instead, Yahoo has chosen to let users write their own reviews.

MSN (<http://search.msn.com>)

According to Planet Ocean (2006) average time for our Website to be ranked by MSN is 30 days from submission date.

<http://search.msn.com/docs/submit.aspx>

Checking Website status will be possible in MSN search bar:

site:www.thelightingdivision.com

To see which pages MSN sees linking to any one of our individual pages:

Link:www.thelightingdivision.com/path to our page.html

Ask

<http://sp.ask.com/en/docs/about/webmasters.shtml> - Ask search technology page

Ask does not accept site submissions. Instead, they find new sites by following links. If we wish to have our site The Lighting Division listed with Ask, it is necessary to get other people to link to us. These links should preferably be directed from the sites that have common topics with us.

It is possible to see if Ask has been indexing our web pages by checking server logs for the following: User-agent: Mozilla/2.0

The time frames between submission and search engine recognition of the Website may be between 30 to 60 days.

Blogging

Blogs can cover any topic and can even be written by multiple authors. Fast way to familiarize ourselves with blog writing is through reading such blogs.

<http://fastlane.gmblogs.com>. GM is one of the best examples of a business to promote itself.

There are a number of web directories and services. <http://weblogs.com> maintains recent updates blogs, which then is distributed to other blogging services all around the Internet. Setting up the blog is automatically ping (let people know that their Website has been updated) weblogs.com – one of the ways to help the blog reach the widest audience. Most blogging software is set up to automatically ping several blog directories and other services. <http://pingomatic.com> helps to tell what sites to automatically ping.

The way blogs are different from normal web pages is that they actively promote and distribute themselves through the Internet using a technology called RSS (Really Simple Syndication). RSS is the technology that allows people to subscribe to a blog that we will create very soon for the Lighting Division. People use software (aggregator) or feed reader to make blog posts come to them. Our blog posts that would cover light emitting diode technology and modern lighting products would automatically be sent to subscriber's computer where they will be able to pick and choose which post interests them the most.

Making people subscribe to our blogs.

- 1) Choosing the right software. One of the Google's links: <http://www.blogger.com/start> - an easy free tool that The Lighting Division will be using for blogging.

- 2) There is a connection between Blogger blog and normal Website. Anything that is posted in Blogger will be indexed within days and will be reflected in ranking of our regular Website.

Other blogging tools are: <http://www.sixapart.com/movabletype/> , Wordpress <http://wordpress.org>, Blogharbor <http://www.blogharbor.com>, RadioUserland <http://radio.userland.com>

Before starting to blog The Lighting Division would have to identify its audience, specific topics within the industry of manufacturing, sales and distribution of lighting products. We will have to keep in mind that people read blogs for information, entertainment and gaining personal experience.

<http://www.technochrati.com> will help us find blogs related to our industry and topic.

<http://google.com/alerts> will keep us keep track of the latest news on any topic and will provide us with a continual source of information about the latest new blog post material.

It is necessary to submit the Website address in the blog, update it regularly, and work with keywords' optimization frequently.

Results and discussion

The present project contains a detailed analysis of search engine optimization methodology and theory behind it. Although it covers practical implementation of only the first stage in construction and development of the online store called www.thelightingdivision.com, it demonstrates future company plans that encompass elements for Internet Marketing. The main project limitation is a factor of time. According to the section called "Getting the Website listed" it may take up to 12 months to start rank high with various search engines. The section "Link

building” explains that search engines encourage the process of gradual link building and are suspicious of the sites that get very many links over night. Therefore, link building strategy may take from 6 months to 12 months for www.thelightingdivision.com. Keywords identification is an ongoing process that is very significant for content writing. Looking for the best keywords, key phrases and incorporating them into web content, blogging, design elements is significant. Changes ought to be made every 1 or 2 months, update of various sections is an important component of search engine optimization. Analysis of keywords that customers will use to get to Website pages is another critical function for The Lighting Division.

At this time it is impossible to forecast the time frames for the online store to rank high with the main search engines – Google, Yahoo!, MSN, Ask. Offline marketing strategy should improve the Website ranking. Promotion of the Website through all the printed materials, trade shows and demonstrations will lead to increased popularity of The Lighting Division online store. Certain SEM methods will bring their results after many months of research and practical work on the online store www.thelightingdivision.com

References

- Arnold, S. E. (2005, September/October). Relevance and the End of Objective Hits. *Online*, 29(5), 16-22. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Brent, D. (2005, April 1). SEM knowledge adds value to firm, clients. *Marketing News*, 39(6), 7-19. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Brusha, P. (2006, April 26). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada
- Calishain, T., & Dornfest, R. (2005). *Google Hacks. Tips & Tools for Smarter Searching*. United States of America: O'Reilly Media, Inc.
- Can Anyone See You? (2005, July). *Folio*, 34(7), 52-54. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Cytrynbaum, D. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Evans, S. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Figallo, C. (1998). *Hosting Web Communities: Building Relationships, Increasing Customer Loyalty, and Maintaining a Competitive Edge*. United States of America: John Wiley & Sons. Retrieved May 22, 2006, from <https://library.books24x7.com>
- Fishkin, R. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.

- Friedlein, A. (2003). *Maintaining & Evolving Successful Commercial Websites: Managing Change, Content, Customer Relationships, and Site Measurement*. United States of America: Morgan Kaufmann Publishers. Retrieved May 22, 2006, from <http://library.books24x7.com>
- Fox, B. (2005, April/May). Google Searches for Quality Not Quantity. *New Scientist*, 186(2497), 24-25. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Garrand, T. (2001). *Writing for Multimedia and the Web Second Edition*. United States of America: Focal Press.
- Goodman, A. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Google lowers ranking for BMW's German site. (2006, February 6). *Telecomworldwire*, 1. Retrieved May 22, 2006, from <http://proquest.umi.com>
- Google warns search engine users of potentially harmful sites. (2006, August 8). *Telecomworldwire*, p. 1. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Gordon, I. D. (2006, June 15). Google's PageRank and Beyond: The Science of Search Engine Rankings. *Library Journal*, 131(11), 100-102. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Gosney, J. W., & Boehm, T. P. (2000). *Customer Relationship Management Essentials*. Premier Press. Retrieved August 24, 2006, from <http://library.books24x7.com>
- Greenberg, K. (2000, October 30). 'Tis the E-season. *Adweek (Eastern edition)*, 41(44), 56-62. Retrieved May 22, 2006, from <http://proquest.umi.com>

- Hekl, J. (2005, February). Beyond Search Engine Marketing - Increase Post-Click Conversion Rates with Intelligent Search. *Customer Inter@ction Solutions*, 23(8), 58-62. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Howard, B. (2004, February). Optimize Search Results Now. *Target Marketing*, 27(2), 81-84. Retrieved August 23, 2006, from <http://proquest.umi.com>
- Jansen, B. J., & Molina, P. R. (2006). *The Effectiveness of Web Search Engines for Retrieving*. Information Processing and Management. Retrieved May 22, 2006, from <http://www.elsevier.com>
- Jarboe, G. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Karcher, G. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Kavanagh, M. (2006, January). Discover the Secrets Behind Search Engine Technology and Find the Right Results for You. *Inside the Internet*, 13(1), 4-7. Retrieved May 22, 2006, from <http://proquest.umi.com>
- Kendler, P. B. (2006, May). Perspectives. *Bank Systems & Technology*, 43(5), 44-46. Retrieved May 22, 2006, from <http://proquest.umi.com>
- Kennedy, A. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Kent, P. (2004). *Search Engine Optimization For Dummies*. United States of America: John Wiley & Sons. Retrieved May 22, 2006, from <http://library.books24x7.com>

- Kerin, B. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Keyes, J. (2000). *Internet Management*. United States of America: Auerbach Publications.
- Klein, K. E. (2006, July 5). Small Business; In Box; Getting to the Top of Online Searches. *Los Angeles Times*, p. C5. Retrieved August 26, 2006, from <http://proquest.umi.com>
- Lattner, J. (2005, November). Personalization in a Search World. *Target Marketing*, 28(11), 37-40. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Lee, K. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Lohr, S. (2006, April 9). The Boring Headline Is Written for Google. *The New York Times*, ideas & trends. Retrieved May 22, 2006, from <http://global.factiva.com>
- Mahaney, S. (1997-2006). Avoiding the Google Sandbox. In <http://www.searchengineneeds.com>. Retrieved August 24, 2006, from Planet Ocean Website: http://www.searchengineneeds.com/alacarte/Avoiding_The_Google_Sandbox.
- Mangalindan, M. (2003, June 16). E-Commerce (A Special Report) --- Playing the Search-Engine Game: The best way to find new customers is to make sure they find you; Here's how to make that happen. *Wall Street Journal (Eastern edition)*, p. R.1. Retrieved May 22, 2006, from <http://proquest.umi.com>
- Marckini, F. (2001). *Search Engine Positioning*. United States of America: Wordware Publishing. Retrieved May 22, 2006, from <http://library.books24x7.com>

Mastering Your SEO. (n.d.). *Folio*, 35(5), 23-24. Retrieved May, 2006, from

<http://proquest.umi.com>

McAlpine, R. (2001). *Web Word Wizardry. A Guide to Writing for the Web and Intranet.*

Berkley, California: Ten Speed Press.

Moran, M., & Hunt, B. (2005). *Search Engine Marketing, Inc.* New Jersey: IBM Press.

Pollit, M. (2005, November 17). Technology: Cashing In on Fake Blogs: 'Splogs'

Are Polluting Search Engine Results in the Chase for Advertising Revenue,

but Little Can Be Done to Stop the New Scam. *The Guardian*, p. 6. Retrieved

August 24, 2006, from <http://proquest.umi.com>

Radin, D. (2006, March 18). Search for a Better Way Online Marketers Using New Approaches

And Tools To Reach Their Customers. *Pittsburg Post-Gazette*, business. Retrieved May

22, 2006, from <http://global.factiva.com>

Research: Prevalence of SEO and SEM. (2006, March 20). *PRweek. (U.S. ed.)*, p. 12. Retrieved

August 29, 2006, from <http://proquest.umi.com>

Reynolds, J. (2004). *The Complete E-Commerce Book: Design, Build, & Maintain a Successful*

Web-based Business, Second Edition. United States of America: CMP Books. Retrieved

May 22, 2006, from <http://library.books24x7.com>

Robinson, K. (2005, April 1). Seven Simple Techniques Ready Site for Search. *Marketing News*,

39(6), 17-20. Retrieved August 24, 2006, from <http://proquest.umi.com>

Sack, M. (2006, April 25). *Search engine strategies 2006. Conference and expo.* Lecture

presented at a Conference, Toronto, Canada.

- Separating Yourself from the Pack. (2004, August). *The American Salesman*, 49(8), 3. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Schultz, J., & Fristedt, J. (n.d.). Calling All Search Engines. *Association Management*, 8-14. Retrieved May 22, 2006, from <http://proquest.umi.com>
- Scoviak, M. (2005, March). Optimize the Internet. *Hotels*, 39(3), 45. Retrieved May 22, 2006, from <http://proquest.umi.com>
- Slegg, J. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- Sweatt, A. (2005, September). On the Web. *Modern Machine Shop*, 78(4), 34-35. Retrieved August 24, 2006, from <http://proquest.umi.com>
- Sweeney, S. (2001). *The e-Business Formula for Success: How to Select the right e-Business Model, Website Design, and Online Promotion Strategy for Your Business*. United States of America: Maximum Press. Retrieved May 22, 2006, from <http://library.books24x7.com>
- Szetela, D. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.
- The Unfair Advantage Book on Winning the Search Engine Wars, verion SE117*. (2006, May 1). Kailua-Kona: Planet Ocean Communications. Retrieved May 22, 2006, from <http://www.searchengineneews.com>
- Wagg, S. (2006, April 25). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.

Where the small can be mighty. (2005, November). *Revolution, London*, 48-50.

Retrieved August 26, 2006, from <http://proquest.umi.com>

Weatherwax, A. (2006, April 26). *Search engine strategies 2006. Conference and expo*. Lecture presented at a Conference, Toronto, Canada.

Appendix A. Indexing of pages.

Titles for the Web Pages	URL's
index (home page) INDEX	http://www.thelightingdivision.com/index.htm
Company index page "about us" INDEX	http://www.thelightingdivision.com/company/index.htm
History INDEX	http://www.thelightingdivision.com/company/history.html
Management NO INDEX	http://www.thelightingdivision.com/company/management.html
News INDEX	http://www.thelightingdivision.com/company/news.html
Privacy terms (non-disclosure agreement online) NO INDEX	http://www.thelightingdivision.com/privacy_terms.html
residential applications INDEX	http://www.thelightingdivision.com/residential_apps/index.htm
home and garden INDEX	http://www.thelightingdivision.com/residential_apps/home_and_garden.html
Boating and docks INDEX	http://www.thelightingdivision.com/residential_apps/boating_and_docks.html
Pool lighting and pond lighting INDEX	http://www.thelightingdivision.com/residential_apps/pool_lighting_and_pond_lighting.html
Signage INDEX	http://www.thelightingdivision.com/residential_apps/signage.html
Industrial applications INDEX	http://www.thelightingdivision.com/industrial_apps/index.htm
Darkroom lighting INDEX	http://www.thelightingdivision.com/industrial_apps/darkroom_lighting.html
Safety and Stage Lighting INDEX	http://www.thelightingdivision.com/industrial_apps/safety_and_stage_lighting.html
Medical applications INDEX	http://www.thelightingdivision.com/industrial_apps/medical_applications.html
Restaurant lighting INDEX	http://www.thelightingdivision.com/industrial_apps/restaurant_lighting.html
Signage INDEX	http://www.thelightingdivision.com/industrial_apps/signage.html
Products index page INDEX	http://www.thelightingdivision.com/products/index.htm
Lighting kit page INDEX	http://www.thelightingdivision.com/products/Lighting_kit.html
Light case INDEX	http://www.thelightingdivision.com/products/Light_case.html
Fiber optic cable (FOC) INDEX	http://www.thelightingdivision.com/products/FOC.html
Fiber optic track (FOT) INDEX	http://www.thelightingdivision.com/products/FOT.html
Industrial fiber optic light (IFOL) INDEX	http://www.thelightingdivision.com/products/IFOL.html
Stealth Light INDEX	http://www.thelightingdivision.com/products/Stealth_light.html
Lumacord INDEX	http://www.thelightingdivision.com/products/lumacord.html
Galleries index page NO INDEX	http://www.thelightingdivision.com/main_gallery/index.htm
Dock Lighting and Boat Lighting galleries NO INDEX	http://www.thelightingdivision.com/main_gallery/dock_and_boat_gallery.html
Restaurant lighting galleries NO INDEX	http://www.thelightingdivision.com/gallery/restaurant_gallery.html
Darkroom lighting gallery NO INDEX	http://www.thelightingdivision.com/main_gallery/darkroom_gallery.html
Home Lighting and Garden Lighting gallery NO INDEX	http://www.thelightingdivision.com/gallery/home_and_garden_gallery.html
Pool lighting and pond lighting gallery NO INDEX	http://www.thelightingdivision.com/gallery/pool_and_pond_gallery.html
Customers' testimonials INDEX	http://www.thelightingdivision.com/gallery/testimonials.html
Buying from us INDEX	http://www.thelightingdivision.com/buying_from_us/index.htm
Contest INDEX	in process

Appendix B. Keywords

Pages for the Web Pages	Keywords meta tag/title	Header Tags	Anchor text	Keywords	Keywords density
Index (home page)	Lighting	Welcome to the Lighting Division!	industrial lighting, residential lighting	lighting, light emitting diode (LED), light fixtures, fiber optic lighting, LED (2), garden lights, landscape lighting, light fixtures, lighting store, low voltage lighting, lighting design, lighting, industrial lighting, residential lighting.	Keywords/phrases: 16, Total: 159 words, Density: 0.10%
Company index page "about us"	LED lights	About us	Light emitting diodes (LED's)	darkroom, lighting, LED lighting, LED fixtures, LED, fiber optic lighting, outdoor lighting fixtures, light fixtures, lighting ideas, low voltage outdoor and indoor lighting, light emitting diodes products, stage lighting, task lighting, LED lighting, LED products, lighting, what are light emitting diodes (LED's).	Keywords/phrases: 18, Total: 347 words, Density: 0.8%
History	Lighting ideas	History	Quality Contract Assembly (QCA)	Light emitting diodes (LED's), darkroom lighting, lighting, LED's, lighting, darkroom, lighting, fiber optic light, light, darkroom, LED light fixtures, lighting	Keywords/phrases: 21, Total: 252 words, Density: 0.8%
Management	LED ideas		Quality Contract Assembly (QCA)		
News	LED lighting		promotional brochure		
Privacy terms (non-disclosure agreement online)	privacy and security terms		none		
Residential applications	residential lighting	Residential lighting	new lighting products, new concept of light, sailing and boating, pool lighting, boating, dock gallery, pool gallery	Residential lighting, lighting fixtures, LED lighting, LED lights, night sky(2), lighting (4), LED lighting, fiber optic fixtures, pool lighting.	Keywords/phrases: 24, Total: 266 words, Density: 0.9%
Home and garden	Home lighting and garden lighting	Home and garden	lighting kit, install and handle, home and garden lighting	fiber optic lighting, LED, LED lights, modern lighting, lighting techniques, low voltage LED lighting, LED lighting, LED, lighting kit, accent lighting, light fixtures, light(3)	Keywords/phrases: 26, Total: 252 words, Density: 0.9%
Boating and docks	dock lighting and boat lighting	Lighting for boats and docks	superior products, instructions, boating and dock gallery	LED technology, fiber optic fixtures, contemporary lighting, lighting, night sky, LED lighting, fiber optic, lighting, light, fiber optic, LED lighting, LED, fiber optic lighting, lighting, LED, fiber optic lighting, lighting.	Keywords/phrases: 34, Total: 319 words, Density: 0.10%
Pool lighting and pond lighting	Pool lighting and pond lighting	Pond and Pool Lighting	colors, fiber optic cable (FOC), Fiber optic track (FOT), light case, instructions, pool gallery	lighting, pond, fiber optic, LED, low voltage, lighting, pool lighting, fiber optic, fiber optic cable, Lighting Kit, lighting	Keywords/phrases: 23, Total: 221 words, Density: 0.10%
Signage	LED signs	LED signs	Fiber Optic Cable (FOC), light cases, colors	LED signs, lighting(3), solid-state LED technology, exterior signage, lighting fixtures, fiber optic (2), lights, low voltage, LED, fiber optic, signage(4), light.	Keywords/phrases: 27, Total: 248 words, Density: 0.11%

Industrial applications	industrial lighting	Industrial Lighting	Darkroom lighting(2), our products, stage lighting and safety lighting, fiber optic cable (FOC), medical applications, myriad, LED and fiber optic lighting, restaurant lighting(2), colors	Darkroom lighting, darkroom, LED's, light, darkroom, path lighting, task lighting, subdued lighting, stage lighting, safety lighting, low voltage LED Light, fiber optic cable, lighting, LED, fiber optic, lighting(3), LED and fiber optic lighting, restaurant lighting, lighting design, LED lights, fiber optic, LED's, accent lighting	Keywords/phrases: 46, Total: 343 words, Density: 0.13%
Darkroom lighting	darkroom	Darkroom light	darkroom products, darkroom gallery	fiber optic, light emitting diodes (LED's), darkrooms, LED's, darkroom, low voltage, cost effective darkroom lighting, light, lights, overhead lighting, fiber optic light, path lighting, darkroom lighting, light	Keywords/phrases: 29, Total: 287 words, Density: 0.10%
Safety and Stage Lighting	Led stage lighting	Stage lighting and safety lighting	lighting products, primary colors	LED's, fiber optic, lighting techniques, stage lighting, safety lighting, flexible fiber optic, light, flexible LED, lighting products, lighting, LED lighting and fiber optic, LED, fiber optic, safety lighting, task lighting, fiber optic (2)	Keywords/phrases: 37, Total: 282 words, Density: 0.13%
Medical applications	hospital lighting	Medical applications	ongoing research, lighting impacts our health,	lighting (2), LED's, fiber optic products, light emitting diodes, fiber optic fixtures, lighting, overhead lights, dimmable lights, lighting (2), low voltage light emitting diode, traditional lighting, light	Keywords/phrases: 27, Total: 94 words, Density: 0.13%
Restaurant lighting	restaurant lighting	Restaurant lighting	Fiber Optic Cable (FOC), costs in electricity, our lighting products, restaurant gallery	light, interior designers, accent lighting, interior design, light emitting diodes, fiber optic, lighting ideas, fiber optic cable, LED's, fiber optic, lighting kits, light, lighting, lighting products.	Keywords/phrases: 27, Total: 163 words, Density: 0.17%
Signage	Lighting	LED signs	Fiber Optic Cable (FOC), light cases, colors	LED signs, lighting(3), solid-state LED technology, exterior signage, lighting fixtures, fiber optic (2), lights, low voltage, LED, fiber optic, signage(4), light.	Keywords/phrases: 27, Total: 248 words, Density: 0.11%
Products index page	lighting products	Lighting kit, Light case, Fiber Optic Cable, Fiber Optic Track, Industrial Fiber Optic Lighting, Stealth Light, Shrink tubing, power splitter, power supply, silicone adhesive sealant, handi-cut	eyes, adhesive sealant, fiber optic cable, fiber optic track	Lighting kit, light, fiber optic (6), light, lighting, ceiling light, lighting	Keywords/phrases: 13, Total: 40 words, Density: 0.03%

Lighting kit page	Lighting kit	Lighting kit, Light case, Fiber Optic Cable, Fiber Optic Track, power supply, shrink tubing, power splitter, silicone adhesive sealant, handi-cut	eyes, fiber optic track (FOT)	fiber optic (7), lighting kit, fiber optic light, light	Keywords/phrases: 18, Total: 285 words, Density: 0.6%
Light case	Light case	Light case	none		Keywords/phrases: 1, Total: 36 words, Density: 0.03%
Fiber optic cable (FOC)	fiber optic	Fiber Optic Cable (FOC)	none	fiber optic (4)	Keywords/phrases: 9, Total: 149 words, Density: 0.6%
Fiber optic track (FOT)	fiber optic track	Fiber Optic Track (FOT)	fiber optic cable	fiber optic (5)	Keywords/phrases: 10, Total: 132 words, Density: 0.08%
Industrial fiber optic light (IFOL)	fiber optic light	Industrial Fiber Optic Light (IFOL) is a multi-functional fiber optic light source.	industrial lighting	fiber optic light, fiber optic light	Keywords/phrases: 6, Total: 58 words, Density: 0.1%
Stealth Light	LED task lighting	Stealth Light	stealth light	light, kitchen lighting, home lights, garden lights, local lighting, accent lighting, task lighting.	Keywords/phrases: 13, Total: 85 words, Density: 0.15%
Lumacord	Luminary	Lumacord	instructions	fiber optic cable, safety lighting, night sky, light fixture, light, electricity, fiber optic, lighting.	Keywords/phrases: 14, Total: 199 words, Density: 0.07%
Lighting galleries index page	Lighting gallery		no index	no need to index	
Boat Lighting and Boat Lighting	Lighting for boats and docks		no index	no need to index	
Restaurant lighting	restaurant lighting		no index	no need to index	
Darkroom lighting	darkroom and lighting		no index	no need to index	
Home Lighting and Garden Lighting	the lighting division		no index	no need to index	
Pool lighting and Pond lighting	pond and pool lighting		no index	no need to index	
Customers' Testimonials	LED	Testimonials from our customers	none	Lighting, LED Lighting	Keywords/phrases: 14, Total: 199 words, Density: 0.06%
Coming from us	Lighting		no index	no need to index	
Interest			in process	in progress	

Appendix C. Competition for meta tags and title keywords.

Titles for the Web Pages	Keywords meta tag/title	Competition (first 2 pages of Google) August 14, 2006(11:52)
index (home page)	Lighting	Progress Lighting, Cooper Lighting, Seagullighting, Lithonia Lighting, Techlighting, Thomas Lighting, Vincent Lighting, Clipsal, Strand Lighting, Juno Lighting, Hubbell Lighting, Kim Lighting, Beacon Lighting
company index page "about us"	Lighting applications	ERCO, Philips, Crestron, Catalina Lighting, Inc., GE, OLLA, Albeo
history	Lighting ideas	Osram Sylvania, Garbes, BuyPalmTrees.com
management	LED ideas	Extreme LED, Glitterburg Lights, LEDsupply.com
news	new light	NONE
privacy terms (non-disclosure agreement online)	privacy and security terms	
residential applications	residential lighting	Residential lighting.com, Norwell, Prolighting, Starry Night Lights
home and garden	Home lighting and garden lighting	Sunrise Lighting, Shopoutdoorlighting.com, Five Rivers Lighting, Lightingdirect.com
floating and docks	dock lighting and boat lighting	shopoutdoorlighting.com, Aqualights, lampsPlus.com, MSC Industrial supply company
pool lighting and pond lighting	Pool lighting and pond lighting	InYopools.com, YardBright.com, Pondliner.com
signage	Signage	Accent Signage Systems, Inc., Mildred's House of Signage, Adaptive microsystems LLC,
industrial applications	industrial lighting	Graybar, Philips, Reeflite, Koehler-Bright Star, Inc. Abacus, e-lights.com, GE, SperoLighting.com
darkroom lighting	darkroom	Nova, PNWX, www.nleindex.com
safety and Stage Lighting	Led stage lighting	chamaelion.com, Ledtronics.com, Kinetic Lighting, inc., www.newark.com ,
medical applications	hospital lighting	MSEC, Famco Hospital Lighting, bulbtronics.com,
restaurant lighting	restaurant lighting	Alluminare Lighting, Galasource.com, restaurantlights.com
signage	Lighting	http://www.fastsigns.com , Signarama, the LED sign company
products index page	lighting products	Google, HP, 3M, Adobe
lighting kit page	Lighting kit	other topics
light case	Light case	other topics
fiber optic cable (FOC)	fiber optic	Fiber Optic Products, Inc., www.neon-das.com , Supervision International
fiber optic track (FOT)	fiber optic track	Global Spec, LabEssentials, Timbercon
industrial fiber optic light (IFOL)	fiber optic light	Optic Light.com, www.fiberopticproducts.com , Pegasus Associates
task Light	LED task lighting	www.tasklighting.com , Dazor, Human scale, progress lighting,
lumacord	Luminary	Sony, Microsoft, Texas instruments,
galleries index page	Lighting gallery	no index
Boat Lighting and Boat Lighting	Lighting for boats and docks	no index
restaurant lighting	restaurant lighting	no index
darkroom lighting	darkroom and lighting	no index
Home Lighting and Garden Lighting	the lighting division	no index
pool lighting and pond lighting	pond and pool lighting	no index
customers' testimonials	LED	Extreme LED, Glitterburg Lights, LEDsupply.com
buying from us	Lighting	no index
contest		in process

Appendix D. Guide to the Major Web Directories

Last update: August 1, 2006

The 10 Best General Directories

Directory	Add	Cost	Comments
DMOZ	Add	Free	Could take up to a year or more for our site to be listed.
Yahoo Directory	Add	\$299/year for commercial sites, free otherwise	The site will also be listed in several international Yahoo directories.
Microsoft bCentral	Add	\$49/year	It is less expensive to submit in bulk, pricing options also available.
Best of the Web	Add	Free for non-commercial sites. \$49.95/year or \$149.95 one-time.	As name indicates, was once an award site.
GoGuides	Add	\$69.95 per URL. If you want to add multiple sites, charges between \$19.95 and \$49.95 per month to be an editor.	Sites are instantly included. High prices makes it best suited for SEOs who might like to add a lot of their client's sites.
JoeAnt.com	Add	\$39.99 one-time fee, free for editors	Takes about a week to be listed either way.

Gimpsy	Add	\$40 to be reviewed within 72 hours, \$20 refund if site is turned down. Free submit available, but can take months to be listed.	Focused primarily on commercial sites. Can be difficult to find the proper category to submit to.
Uncover The Net	Add	Paid submission costs between a \$39 one time fee and \$348 per year, depending on features	No free submission feature.
Site-Sift	Add	\$34.95 one-time fee, Sponsored Listing \$100.00 per year	Not very well known, but lots of high PageRank internal pages.
Wow Directory	Add	Free normally; \$20 for express review; \$40 gets you "Top of Category Placement".	Claims to be the world's largest free directory.

Other Top General Directories

Directory	Add	Cost	Comments
01 Web Directory	Add	Free. \$49 one-time fee for Priority Express 3-day Submission	Full refund if site not accepted.
Linkopedia	Add	\$9.95 one-time fee.	Sites are guaranteed to be reviewed

			within 24 hours.
Site Snoop	Add	\$10 one-time fee.	
Massive Links	Add	\$9.99 one-time fee for basic listing, \$19.99 one-time for 5-link listing, \$49.99/year for premium listings.	Permits you to write our own keyword-rich link anchor text. Free for non-profits.
Tygo	Add	\$39.99 one-time fee.	Permits to write our own keyword-rich link anchor text.
BigAll	Add	\$14.95 refundable review fee.	Newer directory, but rapidly increasing in popularity.
Web Beacon	Add	\$39.99 one-time review fee, free for editors.	Originally created from the GoGuides database, expanded since.
Azoos	Add	\$69.95 for the first URL, \$59.95 for each additional submission	Allows to modify your listing whenever we choose
This is Our Year	Add	\$19.95 one-time fee, every 10th site added is free.	Price includes at least 10 direct links to our site.
SevenSeek	Add	\$49.95 to add a url, will list within 2 days. No free submit.	Also operates a moderately popular web portal.

Browse8.com	Add	\$35 one time review fee, free for editors.	Fairly new directory, not a lot of entries, but decent PageRank.
Skaffe	Add	One time \$39.99 fee, free if you become an editor.	Becoming an editor is not difficult, and is an easy way to get listed for free.
IllumiRate	Add	Free.	Can take up to 6 months to be listed. Faster if we become an editor.
Rubber Stamped	Add	\$25 one-time review fee.	Decent directory, but not much to offer in terms of link equity.

The Top Article Directories

Directory	Add	Cost	Comments
Ezine Articles	Add	First 10 articles submitted are free.	If they like our articles, they'll let us submit unlimited articles for free.
GoArticles	Add	Free.	Unlimited numbers of articles can be submitted for free.
Article Dashboard	Add	Free.	Unlimited numbers of articles can be submitted for free.
Article Finders	Add	Free.	Unlimited numbers of articles can be submitted for free.

Article City	Add	Free.	Unlimited numbers of articles can be submitted for free.
Idea Marketers	Add	Free.	Unlimited numbers of articles can be submitted for free.
Article Alley	Add	Free.	Unlimited numbers of articles can be submitted for free. Can take awhile for an application to be approved.
Article Depot	Add	Free.	Unlimited numbers of articles can be submitted for free.
Certificate.net	Add	Free.	Unlimited numbers of articles can be submitted for free. Will sometimes include an email address in a signature line. So we may want to use an email address that you don't mind being publicly available, such as a hotmail, yahoo, or gmail account.
Amazines	Add	Free.	Unlimited numbers of articles can be submitted for free.

Appendix E. Content of web pages

INDEX PAGE

Welcome to the **Lighting** Division!

Our company offers a range of **lighting** products based on new **light emitting diode (LED)** technology.

Our decorative, accent and task **light fixtures** are engineered and developed with low cost, long life and safe environmental practices in mind. The **fiber optic lighting** and **LED** solutions empower people to do more and find multiple applications in such areas as medicine, photography, theater, entertainment and many others.

Home owners appreciate our **garden lights**, **landscape lighting** and indoor **light fixtures** all year round due to the unique qualities of the technology that we use.

Our **lighting store** offers energy saving, **low voltage lighting** products that will allow you to enjoy the natural beauty of the night once you choose your own **lighting design**.

Dare to dream with us taking a step towards new, simple and elegant **lighting** style!

Please check out our **industrial lighting** and **residential lighting** pages

Would you like to participate in our monthly contest?

Keywords: lighting, light emitting diode (LED), light fixtures, fiber optic lighting, LED (2), garden lights, landscape lighting, light fixtures, lighting store, low voltage lighting, lighting design, lighting, industrial lighting, residential lighting.

ABOUT US

Photography

The **darkroom** environment of the photographic manufacturing facilities may challenge the safety and efficiency of their operators. At the same time, light sensitive products must be protected from the unwanted photographic effect (fog). **Lighting** research has proved that through the use of **LED lighting**, target visibility could be significantly improved due to very tight monochromatic spectral output and the elimination of the need for filters.

We are happy to introduce darkroom **LED fixtures** that provide high quality and efficiency to both customers and employees of the photo industry.

Home and garden

Our **LED** and **fiber optic lighting** solutions will allow you to create a sense of comfort, peace and tranquility inside and outside of your home. Directional **outdoor lighting fixtures** for walkways, steps and stairways will ensure your safety. Once you decide to try our **light fixtures**, every inch of the lighted space in both your home and garden will be charged with a whole new meaning for you and your loved ones.

Our new **lighting ideas** will help you to overcome the limits of your own imagination.

Our **low voltage outdoor and indoor lighting** will enhance the beauty of your home, yard and garden and enable you to prolong the time of much needed rest and enjoyment.

Public and private establishments

Multi-colored **light emitting diode products** encourage various public and private institutions to further use of light as a means of safety, security, energy saving and decoration. We are proud to declare that our solutions became advantageous for theatres and schools (**stage lighting**), dentists' processing laboratories (medical applications), restaurants (accent and **task lighting**).

The result of our cooperation has brought significant saving in energy and maintenance costs to all our business partners. If you compare florescent lamps with **LED lighting**, electricity costs will be reduced by up to 90 times with the use of alternative **LED products**.

We feel privileged to serve the needs of hospitals and senior health care facilities that try hard to improve residents' sleep quality and decrease falls due to poor **lighting**.

What are light emitting diodes (LEDs)?

Keywords: darkroom, lighting, LED lighting, LED fixtures, LED, fiber optic lighting, outdoor lighting fixtures, light fixtures, lighting ideas, low voltage outdoor and indoor lighting, light emitting diodes products, stage lighting, task lighting, LED lighting, LED products, lighting, what are light emitting diodes (LED's).

HISTORY

The idea of opening a new product line of **light emitting diodes (LED's)** occurred to Richard Frank and John Newton in 2002.

This happened when Eastman Kodak Co. in Rochester, NY approached QCA (Quality Contract Assembly) with a need to update their current **darkroom lighting** system used for operator safety and efficiency in the production areas.

With advancements in solid state **lighting, LED's**, such as their tight wavelengths, energy efficiency, reliability, and repeatability it became clear this would be the future of **lighting** for many applications. For the low light level **darkroom** and the subdued **lighting** used for eye adjustment, the future is now! The system became complete with the addition of a **fiber optic light** cable and a clear understanding of how the eye perceives **light** under certain conditions.

The complete system brings state of the art to the **darkroom**, rivaled by none in material and installation cost, maintenance, brightness perception, product integrity, energy efficiency, and ease of design. The system is credited with raising operators' quality of work life, efficiency, and most importantly increasing their safety.

Further with the success of the **LED light fixtures** as a darkroom system, The **Lighting** Division expanded **lighting** applications into a multitude of other industrial and residential sectors.

Our business clients such as Xerox Corporation, Lucky Film Co. Ltd, NYC Transit, Honeywell Technology Solutions, Lucent Technologies and many other well-known and respected organizations recognized our efforts and contributions to their businesses and consequently to their customers.

Keywords: Light emitting diodes (LED's), darkroom lighting, lighting, LED's, lighting, darkroom, lighting, fiber optic light, light, darkroom, LED light fixtures, lighting.

MANAGEMENT

Richard Frank, President of The Lighting Division, graduated Western New England College with a Degree in Marketing & Management in 1972. After graduation he joined IBM in Burlington, Vermont for his Co-op and moved on to a position of production control analyst in Cybron Instruments, Taylor Division. All the knowledge that he gained in production and manufacturing allowed him to become a director of manufacturing in Kayex Semiconductor. This position opened the doors for his next jobs as a General Manager of first Canadian company Lunitech and then, Cannon Industries.

Richard always dreamed about having his own business. Therefore, he always tried to take jobs with small troubled businesses that needed help. Learning by observing the mistakes of others

allowed Richard to get enough experience to open his own company, QCA (Quality Contract Assembly), in 1990. His company has been developing, prospering and succeeding in mechanical assembling and engineering tasks. Organizations involved in transportation found QCA services indispensable. Richard Frank's company provided high level customization, taking various engineering jobs and demonstrating discipline in completion of very complex tasks. Train signage with the use of LED products led The Lighting Division managers to the discovery of new LED and fiber optic products that we offer to our customers today.

Michael M. Kachala received a BS in Mechanical Engineering and an Executive MBA from Rochester Institute of Technology and maintains a Professional Engineering license in the state of New York. He has 10 years executive experience in materials, operations management and product development, holding senior roles at Iomega Corporation, Philips Electronics and TransAct Technologies. Mr. Kachala has traveled to 55 countries in efforts to direct global sourcing and manufacturing cost reduction over the last sixteen years including assignments at Xerox Corporation and Eastman Kodak.

Keywords: business analyst

RESIDENTIAL LIGHTING

For home and landscape illumination we encourage you to use our new **lighting fixtures**. In the process of artificial light evolution **LED lighting** is the next step in the enhancement of people's ability to perform tasks and influence their emotional state. **LED lights** allow people to see in the dark but not take away from the beauty of the **night sky**. This outstanding **lighting** technology allows you to see but at the same time not be seen.

Home owners, garden lovers, landscapers and pool owners recognize and appreciate the function of illumination as an integral part of their everyday activities. Today we all have a chance to make a difference by changing our living space and surroundings with “The **Lighting** Division” products. Brilliant light, long life, rugged durability and optimum energy are some of the many reasons to consider **LED lighting** as an alternative to conventional **lighting**.

The Lighting Division offers a wide range of **lighting** opportunities for home owners to discover and experience a whole new concept of light.

Sailing and boating enthusiasts who are conscious of **lighting** and battery drain will appreciate both beauty and low energy consumption of LEDs. In the dark, the reassurance of finding your dock outlined by **fiber optic fixtures** is very valuable. Our customers incorporate our **night sky** friendly products into their boat interior and exterior.

Pool lighting inside and outside the perimeter of your pool allows you to enjoy the swimming experience without switching lights on and off. Fiber optic and LED lighting is more diffused and consequently, creates a subtle and intimate atmosphere.

Keywords: lighting fixtures, LED lighting, LED lights, night sky(2), lighting (4), LED lighting, fiber optic fixtures, pool lighting.

HOME and GARDEN

Every home and garden possesses a remarkable character with individual style. Today we bring in another opportunity for you to differentiate your home and property by using **fiber optic lighting** and **LED** technology.

Home owners and garden aficionados certainly benefit from the installation of soft **LED lights** to serve their aesthetic needs all year round. Individuals who have sleeping problems find it

beneficial to work with the new **modern lighting techniques**. Our products contribute in sustaining better night-day natural rhythms for a healthier way of life. One will enjoy natural ambience to its fullest when the garden or yard is illuminated. Our **low voltage LED lighting products** will accentuate the places and objects that are dearest to your heart with your favorite radiant colors.

The comfort created by **LED lighting** is an inexpensive luxury: according to manufacturers' information, **LED** life expectancy are estimated at up to 100,000 hours (more than 11 years). Fiber optic qualities will allow you to be creative with your home and garden decorations. The adaptable and reliable fiber that is a part of our **lighting kit** is a safe and simple solution for directional and **accent lighting**. Our **light fixtures** are easy to install and handle.

The **light** spectrum that will enhance the beauty of your dwelling encompasses various tones of blue, green, red and white (link to the product colors). At the same time you can alternate and blend (link to instructions) colors and experiment with your **light** color palette by using several **light** cases.

Keywords: fiber optic lighting, LED, LED lights, modern lighting, lighting techniques, low voltage LED lighting, LED lighting, LED, lighting kit, accent lighting, light fixtures, light(3)

LIGHTING FOR BOATS AND DOCS

LED technology and **fiber optic fixtures** working together or separately satisfy almost every mariner's need. For those of us who are interested in sailing and boating, we offer **contemporary lighting** equipment that is weather resistant, low voltage and built to last.

Stairs, seawall ladders, railings and walkways of docks may be quite hazardous without proper **lighting**. Outlining your dock will not only highlight these areas but also act as a beacon to guide you home safely. Drawing attention to specific features of your boat may serve not only as a good safety technique but also as an elegant way to decorate your vessel. Our products enhance the tranquil atmosphere desired when sailing and boating at night without intrusion of blinding bright lights. Modern LED lighting technology with the option to choose from an array of colors will intensify your sailing experience letting you enjoy the **night sky** even more.

LED lighting and **fiber optic** products developed by The **Lighting** Division are optimal for fast eye adaptation at night, which is critical for navigation. Our luminaries with specific wavelength (monochromatic color) are conducive to acquiring night vision and maintaining it.

Our knowledge of perception of **light** by the human eye allows us to take into account all the best characteristics of **fiber optic** and **LED lighting** to deliver a range of superior products for mariners. Please find instructions for the light intensity and placement of the fixture. They are as important as the products' spectral output as perceived by the eye.

With the use of **LED** and **fiber optic lighting** technology you do not have to give a second thought to lamp replacement for years to come. With its low power consumption you will considerably lower the drain on your battery associated with **lighting**.

The benefits of **LED and fiber optic lighting** far outweigh those provided by traditional **lighting**.

Keywords: LED technology, fiber optic fixtures, contemporary lighting, lighting, night sky, LED lighting, fiber optic, lighting, light, fiber optic, LED lighting, LED, fiber optic lighting, lighting, LED, fiber optic lighting, lighting.

POOL LIGHTING and POND LIGHTING

Every pool owner carries a set of creative ideas that embrace inside and outside décor. We realize that **lighting** is considered an important ingredient of every **pond** and pool landscape. With this in mind we suggest that you incorporate your favorite colors to enhance the image of your ideal pond and pool.

Fiber optic and **LED** technology possess a variety of individual features that include durable and solid construction, stability in extreme temperatures, flexibility, **low voltage**, and long service life. These characteristics to create a range of possibilities for inside and outside pond and **pool lighting**. Pliable materials of our products allow personalization and adaptation to every landscape characteristic and length desired.

It is possible to use **fiber optic** track (FOT) and **fiber optic cable** (FOC), for submersible applications. Please be aware that when using the **Lighting Kit** you should NOT place the **Light** Case and power supply in the water. The **Lighting** Division's products answer multiple demands for safety and security in potentially dangerous areas such as steps and water edges. Our products are also perfect for outlining the elevation changes within the landscape surrounding your pool and pond. The cable and/or track are even used to help emphasize changes in water depth.

Keywords: lighting, pond, fiber optic, LED, low voltage, lighting, pool lighting, fiber optic, fiber optic cable, Lighting Kit, lighting.

INDUSTRIAL LIGHTING

Darkroom lighting

Darkroom operations in photographic manufacturing facilities and processing labs require sophisticated yet simple process **lighting** systems. Our products incorporate **LEDs** that are monochromatic and emit a very narrow wavelength of **light**. This allows an operator or a technician to work safely and efficiently within the confines of a **darkroom**. A complete system includes **path lighting** for general room layout, **task lighting** for specific functions, and **subdued lighting** aimed at faster eye adjustment.

Stage lighting and safety lighting

Low voltage LED lights and fiber optic cables (FOC) create a perfect system for outlining the edges of your stage, pathway, isles, and stage access areas for entertainment establishments such as theatres, cinemas, auditoriums and stadiums. No matter how small your stage is, our flexible and narrow diameter **lighting** cable allows a designer to place the product inconspicuously. Our luminaries produce a boundary within the stage limits for added safety. There is also a full control over illumination intensity.

Our products are ideal solutions to the challenges of safety, security and design.

Medical applications

Residents of hospitals, nursing homes and long-term care facilities find **LED** and **fiber optic** systems valuable as they help prevent falls and influence better sleep patterns. The **Lighting** Research Center in Rensselaer Polytechnic Institute discovered a myriad of opportunities for medical staff to use **lighting** as a means of better care and comfort for residents at night.

Conventional overhead **lighting**, which can be uncomfortable at night, can now be replaced by cost-effective, low-voltage, maintenance-free **LED and fiber optic lighting**, resulting in improved sleep patterns of patients.

Restaurant lighting

Lighting design for restaurants, clubs, bars, casinos will create a very special atmosphere for your visitors. **LED lights** produce a remarkable highlight of the objects you are most proud of, demonstrating the elegance, charm, and exquisite design of your interior.

Fiber optic and **LED's** of various colors add variety and radiance to the most attractive areas of your establishment. **Accent lighting** helps to draw your customers' attention and emphasize the assortment of the products that you offer.

Keywords: Darkroom lighting, darkroom, LED's, light, darkroom, path lighting, task lighting, subdued lighting, stage lighting, safety lighting, low voltage LED Light, fiber optic cable, lighting, LED, fiber optic, lighting(3), LED and fiber optic lighting, restaurant lighting, lighting design, LED lights, fiber optic, LED's, accent lighting.

DARKROOM LIGHT

Fiber optic and **light emitting diodes (LED's)** provide a safe and flexible system that meets visibility challenges in photographic **darkrooms**. They greatly benefit to **darkroom** operators who would otherwise work in complete darkness. **LED's** allow greater adaptation of the human eye and permit optimal target visibility.

This is achieved by using the peak sensitivity of the rods in the eye, which are responsible for night vision.

Intensity and wavelength can also be manipulated to activate the cones in the eye, which are responsible for tasks involving reading with minimal damage to dark adapted rods.

The spectral output of the **LED's** used in our **darkroom** products are not only in the peak sensitivity of the eye but are also in the least sensitivity of the product creating a win/win situation. Our safelight practices and **low voltage, cost effective darkroom lighting** products are far superior in many ways. Aside from the product integrity (no fog), the elimination of uncontrolled **light** sources such as hand **lights**, greatly influences operators' efficiency and are much more ergonomically correct.

The versatility of our products voltage requirements for **overhead lighting** allows for a wall plug in transformer, 12vdc or central power supply, 24vdc. The industrial **fiber optic light** (IFOL) for **path lighting** uses 12vdc, 24vdc and 9vdc battery for portable applications.

Darkroom lighting provides an ideal system for the following reasons:

- Low-voltage with minimal current draw can be up to 90 times more efficient than florescent;
- Cost effective in product purchase, product installation, and product maintenance;
- No color filters that can break down;
- Better control of the **light** to the user;
- Up to 100,000 hours of operating life;
- Durable and shock resistant.

Keywords: fiber optic, light emitting diodes (LED's), darkrooms, LED's, darkroom, low voltage, cost effective darkroom lighting, light, lights, overhead lighting, fiber optic light, path lighting, darkroom lighting, light.

STAGE AND SAFETY LIGHTING

Energy-efficient solid-state **LED's** and **fiber optic** technology create an extremely versatile system for the entertainment industry.

Theatres, concerts, shows, theme parks as well as schools and churches use new **lighting techniques** for both **stage lighting** and **safety lighting**.

Our highly **flexible fiber optic** cable utilizes a low-voltage adjustable **light** source allowing the end-user to outline any shape, length of an area or an obstacle. The most frequently encountered applications are those for the walkways, doorways and stairs in the theatres/cinemas where **flexible LED** fiber and track can be shaped to any contour easily during installation.

In addition to these important tasks that are completed by our products, various organizations work with color spectrum for stage effects. The **lighting products** that we offer can be utilized for highlighting the stage scenery to become an outstanding stage effect. Our **lighting** will allow you to eliminate distractions and draw the attention of your audience to wanted effects when desired, while hiding the background and discrete movement behind the stage. For the changes of stage scenery, stage hands will find **LED lighting** and **fiber optic** solutions an ideal tool using the products power to create an effect of seeing but not being seen.

By means of **LED** and **fiber optic** products your enterprise can solve safety issues for your audience, actors, support roles, and staff simultaneously. This is achieved by **safety lighting** techniques involving indirect, accent, and **task lighting**.

Fiber optic cable (FOC) and **Fiber Optic** Track (FOT) that we offer add red, blue, green, amber and white colors as well as many other tones that may be achieved by using several **light** cases.

(Link to instructions of how to blend colors)

Keywords: LED's, fiber optic, lighting techniques, stage lighting, safety lighting, flexible fiber optic, light, flexible LED, lighting products, lighting, LED lighting and fiber optic, LED, fiber optic, safety lighting, task lighting, fiber optic (2).

MEDICAL APPLICATIONS

According to ongoing research, **lighting** plays a major role in the health conditions of people in many ways. Institutions such as hospitals, nursing homes, and senior health facilities realize this and are making positive changes in the **lighting** environment. **LED's** and **fiber optic products** create a reliable system that helps to prevent elderly people from falls.

Light emitting diodes and **fiber optic fixtures** that are offered by the **Lighting** Division solve many problems by improving sleep patterns. Change from bright **overhead lights** at night to soft **dimnable lights** produce a dramatic improvement in residents' comfort and sleep. The quality of work life for staff of various medical facilities is considerably improved.

The report of **Lighting** Research Center describes how **lighting** impacts our health.

Our **low voltage light emitting diode** products have a clear advantage when compared with **traditional lighting**. LEDs do not utilize a filament, which wears out and has to be replaced.

Since there is no bulb generating heat, there is a reduction in energy used for cooling.

Medical facilities enjoy the plug-and-play options of our products such as:

Easy installation

Design and flexibility

Light in a range of different colors

Fully dimmable

Keywords: lighting (2), LED's, fiber optic products, light emitting diodes, fiber optic fixtures, lighting, overhead lights, dimmable lights, lighting (2), low voltage light emitting diode, traditional lighting, light.

RESTAURANT LIGHTING

Light is a very powerful instrument in the hands of **interior designers** who desire to create an atmosphere of relaxation, joy and excitement for restaurant guests. Target or **accent lighting** is an important component of external restaurant architecture and **interior design**. **Light emitting diodes** and **fiber optic products** are designed for both external and internal applications. Decorative architectural **lighting ideas** can be easily fulfilled due to the flexible nature of our **fiber optic cable** (FOC).

By utilizing **LED's** and **fiber optic** devices you will significantly reduce your costs in electricity. With our **lighting kits** you are now armed with a strong tool that enables you to change **light** intensity and color spectrum with the ability to alter your **lighting** to the spirit of a season. Versatility of our **lighting products** will help you gain additional leverage by adding color and variety into your promotional campaigns: feel free to heighten the specialties of the day with brighter colors and dare to experiment with us.

Keywords: light, interior designers, accent lighting, interior design, light emitting diodes, fiber optic, lighting ideas, fiber optic cable, LED's, fiber optic, lighting kits, light, lighting, lighting products.

LED SIGNS

Advanced **lighting** based on **solid-state LED technology** for functional and attractive interior and **exterior signage** and displays can be utilized for a variety of industrial and residential purposes.

The **lighting fixtures** offered by the **Lighting** Division allow you to experiment with **signage** in hospitals, schools, hotels, shopping malls, office buildings, sports stadiums and many other facilities. At the same time you do not have to become a professional architect or a designer to create and mount a sign in your house and even room. Working with our **fiber optic** cable is an exciting experience with a 100% guarantee of success in building your own unique sign. Once the sign is completed, you are free to leave the **lights** on during the day and at night not worrying about high electricity costs.

Popularity of **low voltage** and little maintenance **LED** and **fiber optic** products for **signage** can be explained by such **lighting** attributes as:

- dimnable characteristics,
- sharp resolution, no heat,
- variety of colors
- simplicity of mounting.

Design features of our luminaries allow great freedom of applications for sign makers who can change the signs as frequently as they wish.

Flexible **Fiber optic** cable (FOC) is easily adjustable in any clear insert windows and cut to the length of the sign you wish to create. It holds well on any surface and can be attached by glue, tape or any other adhesives.

Light cases that drive colors will make your **signage** unforgettable, appealing and memorable to the viewers.

Keywords: LED signs, lighting(3), solid-state LED technology, exterior signage, lighting fixtures, fiber optic (2), lights, low voltage, LED, fiber optic, signage(4), light.

LUMACORD

Multi-functional lumacord is a unique marriage of rope and **fiber optic cable** that is used by mariners, pool owners, and landscapers worldwide. Lumacord is an extraordinary creation that increases visibility in the dark and performs protective, guarding and guiding functions at the same time.

When creating this useful product for outdoor use, The Lighting Division concentrated specifically on **safety lighting** around the water, yard and garden. Our customers also utilize lumacord for identification of dangerous zones such as construction and hazardous elevation changes in the dark. Lumacord is a perfect night beacon that simultaneously serves two purposes of a cord or rope and a **night sky** friendly **light fixture**. It serves as an outline or **light** preventive barrier consuming little **electricity** and allowing color changes.

Flexible **fiber optic** cable, consisting of 14 strands with bending radius of almost 1 inch, and rugged cord provide for a perfect multi-functional combination creating an elegant **lighting** effect. Please be aware that for extra brightness we recommend to use two light boxes, working from both ends of lumacord.

Price: \$1.45/ft. if rope and fiber optic cable purchased separately

\$2.45/ft. if a set of rope and fiber is intertwined by The Lighting Division.

Keywords: fiber optic cable, safety lighting, night sky, light fixture, light, electricity, fiber optic, lighting.

Customers' testimonials

John Liu, the owner of the "Chinatown" restaurant in Rochester, NY stated: "I love my new lighting. We receive lots of compliments from customers on it. The glasses and bottles look neat and orderly because of it. There is also a special glow that LED lighting adds to the mood."

PRODUCTS

Lighting Kit

It consists of a **light** case, **fiber optic** cable (FOC), **fiber optic** track (FOT), shrink tubing and power supply.

Light case

Height: 1.55 inches = 3.9 centimeters

Width: 3.75 inches = 9.5 centimeters

Length: 4.83 inches = 12.27 centimeters

Weight: 10 oz. = 283.5 grams

Body material: Cast Aluminum, not submersible.

Dimming capabilities: dimmable

Colors produced:

Do you want to know how color of your **lighting** influences your eyes?

Light case color options:

deep blue:

sky blue:

turquoise

great green

diamond white

amber

tropical red

real red

Voltage: dual. 12vdc/ 24vdc

Price: \$80.00

Add to the shopping cart

Fiber optic cable (FOC)

Total outside diameter : 0.19 inches = 4.8 mm

Cable length: min 25 feet = 7.62 meters

Fiber count: 14. (0.03 inches =0.75 mm each)

Bending radius: 0.95 inches = 24 mm

Temperatures: **Fiber optic** cable remains optically stable within temperature fluctuations from -55 deg. C (-67 deg. F) to +70 deg. C (158 deg. F)

FOC price: \$1.15/ft. (0.31 Meter)

Fiber Optic Cable (FOC) Lengths Options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

[Request a quote](#)

[Add to the shopping cart](#)

Fiber optic track (FOT)

FOT features and dimensions: Flexible, optically clear, plastic, UV-protected track. If desired, it is used for mounting of **fiber optic** cable. Comes with adhesive tape backing, detachable wings.

Placement guidelines: Track can be mounted via attached double-sided tape. To obtain optimal adhesion with tape, the surface must be clean, dry, well-unified. For harsh conditions it is recommended to utilize various hardware such as: self tapping screw, staples or adhesive sealants.

Track length: min 25 feet = 7.62 meters

FOT price: 0.6/ft. (0.31 Meter)

Fiber Optic Track (FOT) Lengths Options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

[Add to the shopping cart](#)

[Shrink tubing](#)

The **Lighting** Division provides 1 foot (0.31 meter) of free shrink tubing to cover the brightest areas of fiber.

Shrink tubing price: 0.30/ft.(0.31 meter)

Shrink tubing length options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

Industrial Fiber Optic Lighting (IFOL)

Height: 2.25 inches = 5.7 centimeters

Width: 4.75 inches = 21.1 centimeters

Length: 6.75 inches = 17.15 centimeters

Weight: 1 lb. = 453.6 grams

Body material: polycarbonate

Dimming capabilities: dimmable

Colors produced:

Price: \$158.22

Add to the shopping cart

Stealth light

Height: 1.55 inches = 3.9 centimeters

Width: 3.75 inches = 9.5 centimeters

Length: 4.83 inches = 12.27 centimeters

Weight: 10 oz.= 283.5 grams

Body material: Cast Aluminum, not submersible.

Dimming capabilities: dimmable

Energy consumption: 350mA

Supply voltage: 12vdc, 24vdc

Stealth light price: \$85.00

Add to the shopping cart

Add to the shopping cart:

Keywords: Lighting kit, light, fiber optic (6), light, lighting, ceiling light, lighting,

LIGHTING KIT

It consists of industrial **fiber optic light** source (s) (IFOL), **fiber optic** cable (FOC), **fiber optic** track (FOT) and power supply.

Light case

Height: 1.55 inches Width: 3.75 inches Length: 4.83 inches Weight: 10 oz. Body material:

Alluminium, not submersible. Dimming capabilities: dimmable

Colors produced:

Do you want to know how color of your lighting influences your eyes?

Light case color options:

deep blue:

sky blue:

turquoise

great green

diamond white

amber

tropical red

real red

Voltage: dual. 12vdc/ 24vdc.

Price: \$80.00

Add to the shopping cart

Fiber optic cable (FOC)

Total outside diameter: 0.19 inches = 4.8 mm

Cable length: min 5 feet = 1.5 meters

Fiber count: 14. (0.03 inches =0.75 mm each)

Bending radius: 24 mm

FOC price: \$1.15/ft. (0.31 Meter)

Fiber Optic Cable (FOC) Lengths Options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

Add to the shopping cart

Fiber optic track (FOT)

FOT features and dimensions: Flexible, optically clear, plastic, UV-protected track. If desired, it is used for mounting of **fiber optic** cable. Comes with adhesive tape backing, detachable wings.

Placement guidelines: Track can be mounted via attached double-sided tape. To obtain optimal adhesion with tape, the surface must be clean, dry, well-unified. For harsh conditions it is recommended to utilize various hardware such as: self tapping screw, staples or adhesives.

Track length: min 5 feet = 1.5 meters

FOT price: 0.6/ft. (0.31 Meter)

Fiber Optic Track (FOT) Lengths Options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

Add to the shopping cart

Instructions for installation:

Keywords: fiber optic (7), lighting kit, fiber optic light, light

LIGHT CASE

Light case

Height: 1.55 inches

Width: 3.75 inches

Length: 4.83 inches

Weight: 10 oz.

Body material: Alluminium, not submersible.

Dimming capabilities: dimmable

Colors produced:

Voltage: dual. 12vdc/ 24vdc.

Price: \$80.00

Add to the shopping cart

FIBER OPTIC CABLE

Fiber optic cable (FOC)

Total outside diameter : 0.19 inches = 4.8 mm

Fiber count: 14 (0.03 inches = 0.75 mm each)

Bending radius: 0.95 inches = 24 mm

Temperatures: **Fiber optic** cable remains optically stable within temperature fluctuations from 55 deg. C (-67 deg. F) to +70 deg. C (158 deg. F)

FOC price: \$1.15/ft. (0.31 Meter)

Fiber Optic Cable (FOC) Lengths Options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

Minimum **fiber optic** cable for sale is 25 feet = 7,62 meters

Installation instructions

Add to the shopping cart

Keywords: fiber optic (4)

FIBER OPTIC TRACK

Fiber optic track (FOT)

FOT features and dimensions: Flexible, optically clear, plastic, UV-protected track. If desired, it is used for mounting of **fiber optic** cable (FOC). Comes with adhesive tape backing, detachable wings.

Placement guidelines: Track can be mounted via attached double-sided tape. To obtain optimal adhesion with tape, the surface must be clean, dry, well-unified. For harsh conditions it is recommended to utilize various hardware such as: self tapping screw, staples or adhesive sealants.

Fiber optic track (FOT) price: 0.6/foot (0.31 Meter)

Fiber Optic Track (FOT) Lengths Options:

25 feet (7.62 meters):

75 feet (22.86 meters):

100 feet (30.48 meters)

125 feet (38.1 meters)

175 feet (53.34 meters)

200 feet (60.96 meters)

Minimum **fiber optic** cable for sale: 25 feet = 7,62 meters

Add to the shopping cart

Keywords: fiber optic (5)

Industrial **Fiber Optic Light** (IFOL) is a multi-functional **fiber optic light** source.

Height: 2.25 inches = 5.7 centimeters

Width: 4.75 inches = 21.1 centimeters

Length: 6.75 inches = 17.15 centimeters

Weight: 1 lb. = 453.6 grams

Body material: polycarbonate

Dimming capabilities: dimmable

Colors produced:

Price: \$158.22

Add to the shopping cart

Keywords: fiber optic light, fiber optic light

STEALTH **LIGHT**

Height: 1.55 inches = 3.9 centimeters

Width: 3.75 inches = 9.5 centimeters

Length: 4.83 inches = 12.27 centimeters

Weight: 10 oz. = 283.5 grams

Body material: Cast Aluminum, not submersible.

Dimming capabilities: dimmable

Energy consumption: 350mA

Supply voltage: 12vdc, 24vdc

Flexible neck: navy blue, black

Please check one of the options:

Navy blue

Black

Stealth light price: \$85.00

Add to the shopping cart

Suggested applications: **Kitchen lighting, home lights and garden lights, local lighting, accent lighting, task lighting.**

Add to the shopping cart

Keywords: light, kitchen lighting, home lights, garden lights, local lighting, accent lighting, task lighting.

LED SIGNS

Advanced **lighting** based on **solid-state LED technology** for functional and attractive interior and **exterior signage** and displays can be utilized for a variety of industrial and residential purposes.

The **lighting fixtures** offered by the **Lighting Division** allow you to experiment with **signage** in hospitals, schools, hotels, shopping malls, office buildings, sports stadiums and many other facilities. At the same time you do not have to become a professional architect or a designer to create and mount a sign in your house and even room. Working with our **fiber optic** cable is an exciting experience with a 100% guarantee of success in building your own unique sign. Once

the sign is completed, you are free to leave the **lights** on during the day and at night not worrying about high electricity costs.

Popularity of **low voltage** and little maintenance **LED** and **fiber optic** products for **signage** can be explained by such **lighting** attributes as:

- dimmable characteristics,
- sharp resolution, no heat,
- variety of colors
- simplicity of mounting.

Design features of our luminaries allow great freedom of applications for sign makers who can change the signs as frequently as they wish.

Flexible **Fiber optic** cable (FOC) is easily adjustable in any clear insert windows and cut to the length of the sign you wish to create. It holds well on any surface and can be attached by glue, tape or any other adhesives.

Light cases that drive colors will make your **signage** unforgettable, appealing and memorable to the viewers.

Keywords: LED signs, lighting(3), solid-state LED technology, exterior signage, lighting fixtures, fiber optic (2), lights, low voltage, LED, fiber optic, signage(4), light.



Anna Y. Boriskina

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